

Table exhibiting the number and description of Native Emigrants who have left Calcutta for minor West Indian Colonies from the year 1861 to 1870, and the numbers returned therefrom during the same period, with the amount of their savings, remittances, &c.

Y <small>EAR</small> .	Minor W. I. Colonies.	EMIGRATED.						RETURNED.						Amount de- posited with the Surgeon Superinten- dent for safe custody.	Amount brought on their persons.	Total	REMARKS.
		Men.	Women.	Boys.	Girls.	Infants.		Men.	Women.	Boys.	Girls.	Infants.					
						Boys.	Girls.					Boys.	Girls.					Boys.	Girls.
1861-63	Grenada	794	211	50	34	19	14	1,123	1,047	Per ship <i>Lincolne</i> , ar- rived 17th April 1869.
1861-63	St. Lucia	255	56	11	8	2	4	336	320½	...	...	...	...	...	...	...
1861-63	St. Vincent	241	49	6	12	2	4	316	300	...	...	...	...	...	...	...
1863-63	None	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1863-64		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1864-65		...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1865-65	Grenada	158	70	28	15	7	6	285	250	...	...	...	...	...	...	...
1865-66	St. Vincent	133	52	19	11	2	6	228	200	...	...	...	...	...	...	...
1866-67	St. Vincent	270	148	34	31	2	5	480	450½	...	...	...	...	...	...	...
1867-68	None	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1868-69	St. Vincent	204	85	30	18	7	5	349	313	...	...	...	...	...	...	...
1869-70	St. Lucia	179	55	23	12	20	5	294 251½	23,979 5 4
1869-70	Grenada	...	...	...	...	...	...	...	...	40	16	6	6	3	2	75 64
	Total	2,055	671	161	129	41	44	2,121	2,881	219	73	29	18	23	7	369 315½	23,979 5 4

Per ship Lincolnton, arrived 17th April 1869.

J. G. GRANT,
Off. Protector of Emigrants.

Table exhibiting the number and description of Native Emigrants who have left Calcutta for Mauritius from the year 1861 to 1870, and the numbers returned therefrom during the same period, with the amount of their savings, remittances, &c.

YEARS.	Colony.	EMIGRATED.						RETURNED.						Amount de- posited with the Surgeon- Superinten- dent for safe custody.	Amount brought on their persons.	Total.	REMARKS.
		Men.	Women.	Boys.	Girls.	Infants.		Boys.	Girls.	Men.	Women.	Boys.	Girls.				
						Boys.	Girls.										
1861-62	Mauritius	5,008	1,220	273	190	130	114	6,936	6,541	1,049	183	86	79	11	1,421	1,322	No information as to the amount of money savings of returns em- igrants from Mauritius is possessed by this office.
1862-63	Ditto	1,799	323	65	28	36	33	2,234	2,191	1,288	217	90	92	10	1,714	1,606	
1863-64	Ditto	1,266	343	85	46	45	37	1,823	1,701	1,595	291	131	89	15	2,144	2,010	
1864-65	Ditto	4,913	1,235	282	193	120	125	6,868	6,385	1,800	325	162	127	18	2,463	2,285	
1865-66	Ditto	9,935	2,838	817	580	470	416	15,115	13,531	2,163	371	142	141	18	2,861	2,600	
1866-67	Ditto	270	112	33	36	11	16	478	416	1,508	261	122	125	16	2,047	1,900	
1867-68	Ditto	187	80	14	15	14	3	313	281	1,210	298	118	141	15	1,797	1,647	
1868-69	Ditto	814	303	51	32	20	17	1,227	1,164	1,030	220	104	84	5	1,446	1,339	
1869-70	Ditto	917	370	100	44	35	33	1,499	1,353	699	146	62	54	9	974	907	
	Total	35,110	6,884	1,720	1,164	881	793	36,552	33,537	12,329	2,312	1,017	942	149	16,867	15,709	

J. G. CHART,
Offy. Protector of Emigrants.

Table exhibiting the number and description of East Indian Emigrants who have left Calcutta for Foreign Colonies from the year 1861 to 1870, and the numbers returned therefrom during the same period, with the amount of their savings, remittances, &c.

Year.	Colony.	EMBARKED.						RETURNED.						Amount of savings remit- ted through the Government.	Amount de- posited with the Surgeon- Superinten- dent for safe custody.	Amount brought on their persons.	Total.	REMARKS.				
		Men.	Women.	Boys.	Girls.	Infants.		Souls.	Adults.	Men.	Women.	Boys.	Girls.						Infants.		Souls.	Adults.
						Boys.	Girls.												Boys.	Girls.		
1861-62	St. Croix ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1862-63	Ditto ...	244	60	14	2	1	321	313	...	...	...	...	...	...	...	...	...	...
1863-64	Ditto ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1864-65	Ditto ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1865-66	Ditto ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1866-67	Ditto ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1867-68	Ditto ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1868-69	Ditto ...	...	...	...	...	...	...	...	186	33	8	3	11	10	250	223	24,638 10 8	{ Per ship <i>Dorothea</i> <i>Melchor</i> , arrived 15th December 1868.
1869-70	Ditto		24,638 10 8			
	Total ...	244	60	14	2	1	321	313	186	33	8	3	11	10	250	223	24,638 10 8					

J. G. GIANT,
Off. Protector of Emigrants.

Table exhibiting the number and description of East Indian Emigrants who have left Calcutta for Foreign Colonies (Réunion) from the year 1861 to 1870, and the numbers returned therefrom during the same period, with the amount of their savings, remittances, &c.

Y <small>EAR</small> .	Colony.	EMIGRATED.						RETURNED.						Amount of savings remitted through the Government.	Amount deposited with the Surgeon Superintendent for safe custody.	Amount brought on their persons.	Total.	REMARKS.
		Men.	Women.	Boys.	Girls.	Infants.		Boys.	Girls.	Boys.	Girls.	Souls.	Adults.					
						Boys.	Girls.											
1861-63	Réunion	3,920	900	224	170	59	60	5,333	5,017	No information as to the amount of money savings of return emigrants from Réunion is possessed by this office.
1862-63	Ditto	726	107	17	6	4	4	864	844	...	...	...	...	...	...	...	...
1863-64	Ditto	223	60	5	2	1	...	231	286	4	...	...	...	...	...	...	...
1864-65	Ditto	1,207	292	39	40	29	20	1,627	1,538	...	...	...	...	...	...	...	...
1865-66	Ditto	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1866-67	Ditto	...	...	...	...	...	...	...	...	210	37	8	21	2	...	278	281
1867-68	Ditto	...	...	...	...	...	...	...	...	236	46	16	22	...	2	322	301
1868-69	Ditto	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
1869-70	Ditto	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Total	6,076	1,359	286	218	93	84	8,115	7,686	450	83	24	43	2	2	604	566	

J. G. GRANT,

Offg. Protector of Emigrants.

Weekly Return of Traffic Receipts on Indian Railways.

EAST INDIAN RAILWAY MAIN LINE.

Approximate Return of Traffic for Week ended 22nd May 1870 on 1,131½ miles open.

	COACHING TRAFFIC.			MERCHANDISE AND MINERAL TRAFFIC.			Total Traffic Receipts.
	Number of Passengers.	Coaching Receipts.		Weight carried.	Receipts.		
		Rs. As. P.	£ s. d.	Mds. Strs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week ...	91,527	1,14,202 15 11	10,408 12 2	7,20,377 0	4,19,078 1 5	59,150 0 8	49,608 12 10
Or per mile of Railway ...		100 14 11	9 5 0		367 11 6	33 14 2	43 19 2
For previous 19 weeks of half-year	21,51,831	30,92,820 1 11	3,38,509 0 0	1,40,75,522 20	70,29,003 0 0	7,20,910 11 5	10,63,923 18 0
Total for 20 weeks ...	22,43,378	39,07,022 1 10	3,43,977 18 11	1,47,76,800 20	83,44,081 1 5	7,64,055 11 11	11,19,054 10 10
COMPARISON.							
Total for corresponding week of previous year ...	92,918	1,15,771 4 5	10,420 0 8	6,64,750 10	3,92,414 8 6	55,074 1 7	46,406 2 5
Per mile of Railway corresponding week of previous year ...		100 0 6	0 4 5		346 15 10	51 16 2	61 5 7
Total to corresponding date of previous year ...	20,68,338	31,64,221 0 0	3,00,635 12 0	1,31,30,203 0	66,42,580 7 5	7,92,236 10 7	10,32,200 2 7

* Rs. 2,800-13-0 added on account of freight on locomotive coal carried on Jabulpore Line.

EAST INDIAN RAILWAY JUBBULPORE LINE.

Approximate Return of Traffic for Week ended 22nd May 1870 on 223 miles open.

		Rs. As. P.	£ s. d.	Mds. Strs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week ...	3,458	8,022 12 1	817 18 5	28,427 20	9,842 11 9	905 5 0	1,700 3 5
Or per mile of Railway ...		40 0 2	3 13 4		44 2 3	4 0 11	7 14 3
For previous 19 weeks of half-year	91,508	3,14,048 3 5	28,797 15 1	8,47,303 10	2,40,765 8 0	22,060 5 1	50,937 0 2
Total for 20 weeks ...	98,056	3,22,070 15 0	29,615 13 6	8,75,631 0	2,50,508 4 5	24,071 10 1	52,577 3 7
COMPARISON.							
Total for corresponding week of previous year ...	2,861	9,194 10 3	842 16 10	26,520 10	7,244 14 2	604 2 4	1,506 19 2
Per mile of Railway corresponding week of previous year ...		41 3 8	3 15 7		32 7 10	2 10 7	6 15 3
Total to corresponding date of previous year ...	67,927	2,04,085 1 10	18,767 16 0	9,24,311 30	2,68,691 1 6	24,630 0 4	49,337 16 4

EASTERN BENGAL RAILWAY.

Approximate Return of Traffic for Week ended 21st May 1870 on 113½ miles open.

		Rs. As. P.	£ s. d.	Mds. Strs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week ...	27,032	14,802 14 8	1,311 2 0	1,23,750 33	18,015 4 6	1,700 4 4	5,617 8 4
Or per mile of Railway ...	247	129 4 8	11 11 0	1,083 0	164 5 8	15 1 4	20 12 10
For previous 20 weeks of half-year	5,13,412	5,13,590 0 9	28,745 8 5	20,90,402 4	3,27,562 2 7	30,025 7 4	58,773 15 0
Total for 21 weeks ...	5,40,444	5,28,392 5 3	29,056 10 5	22,14,361 37	3,45,105 7 11	31,724 11 8	64,391 2 1
COMPARISON.							
Total for corresponding week of previous year ...	23,893	13,635 12 9½	1,251 15 7	79,067 15	15,304 1 1½	1,405 17 6	2,634 13 1
Per mile of Railway corresponding week of previous year ...	211	120 0 4	11 1 1	703 0	135 2 2	12 7 0	23 5 10
Total to corresponding date of previous year ...	5,11,618	3,19,901 2 11½	29,292 10 0	21,14,032 7½	3,34,283 1 1	33,225 17 2	64,568 7 6

CALCUTTA AND SOUTH-EASTERN STATE RAILWAY.

Approximate Return of Traffic for Week ended 21st May 1870 on 28 miles open.

		Rs. As. P.	£ s. d.	Mds. Strs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week ...	5,142	955 1 0	90 15 1	11,746 20	278 1 0	57 18 8	129 8 4
Or per mile of Railway ...	184	32 5 9	3 4 0	419 0	10 0 1	1 7 0	4 11 9
For previous 7 week of half-year	39,001	6,221 12 0	623 3 8	70,522 0	3,678 5 3	207 12 4	859 15 0
Total for 8 weeks ...	38,743	7,127 14 0	713 15 9	82,268 20	3,954 5 0	265 6 7	1,018 4 4
COMPARISON.							
Total for corresponding week of previous year ...	4,681	641 7 6½	77 2 7	12,926 0	476 5 0	43 12 7	130 16 3
Per mile of Railway corresponding week of previous year ...	167	20 0 10	2 15 1	462 0	17 0 4	1 11 2	4 6 2
Total to corresponding date of previous year ...	34,752	7,063 15 1	640 7 8	1,06,71 8	4,157 6 1	563 11 11	1,211 16 11

Meteorological Telegraphic Report for the period 28th May to 3rd June 1870.

STATIONS.	Date.	Hour.	Barometer reduced to 32°.	Barometer reduced to sea-level.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	Weather Initials.	Clouds.
					Dry.	Wet.		Direction.	Velocity.			
CALCUTTA.	May.				☉	☉				Inches.		
	28th	10	29.648	29.688	87.4	81.5	70	E by N	...	...	...	S
	16	29.536	29.551	91.5	83.0	59	SSE	...	...	...	...	K, CK
	20th	10	29.601	29.619	89.0	82.0	89	SE	...	...	...	O
	16	29.476	29.494	89.5	82.0	71	SSE	...	...	...	...	O
	30th	10	29.497	29.515	90.2	84.3	78	SSW	...	...	...	K
	16	29.397	29.415	85.6	78.8	61	SSW	...	...	...	...	O
	31st	10	29.514	29.532	91.2	82.3	68	SSE	...	...	...	O
	June.	16	29.424	29.442	93.0	82.5	48	S	...	...	...	C
	1st	10	29.508	29.520	91.7	83.5	68	S	...	...	...	O
SAGOR ISLAND.	16	29.471	29.489	95.7	84.5	60	S	...	...	...	...	CS
	2nd	10	29.668	29.684	88.5	82.6	85	S by W	...	1.14	...	U
	16	29.550	29.568	92.2	83.5	63	S by W	...	...	...	...	O
	3rd	10	29.680	29.698	90.5	84.1	75	S	...	...	...	K & scuds from S.
	16	29.583	29.581	91.5	83.6	63	S	...	...	...	...	K
	May.											
	28th	10	29.655	29.681	88	83	60	N	...	...	...	N
	16	29.540	29.546	90	85	80	S	...	...	...	...	N
	29th	10	29.602	29.608	87	85	91	N by W	1	0.10	m, o, u	N
	16	29.435	29.491	87	83	83	WSW	1	...	...	d, u, m, b, s	N
CHITTAGONG.	30th	10	29.511	29.517	89	85	84	SSW	2	...	m, o	N
	16	29.420	29.424	90	86	84	S	1	...	...	b, m	N
	31st	10	29.521	29.527	91	86	80	S	3	...	m	N
	June.	16	29.440	29.466	90	85	80	SSW	2	...	m	N
	1st	10	29.584	29.590	90	85	80	S	2	...	m	N
	16	29.618	29.624	90	85	80	SSW	2	...	...	...	N
	2nd	10	29.675	29.681	87	84	80	SSW	2	...	...	N
	16	29.570	29.576	89	84	80	SW	2	...	...	...	N
	3rd	10	29.689	29.705	89	85	84	WSW	2	0.40	...	N
	16	29.578	29.584	90	85	80	SW	3	...	...	...	N
MADRAS.	May.											
	28th	10	29.684	29.703	88	81	72	SE	5.0*	0.10	b, c	K, KS
	16	29.550	29.654	79	77	90	S	0.5*	0.40	d, g, o	...	N
	29th	10	29.593	29.702	86	79	72	ESE	0.2*	0.20	...	K, CK, C.
	16	29.457	29.514	80	81	69	S	8.7*	...	...	...	K
	30th	10	29.483	29.573	87	78	65	E	0.0*	...	b, m	C, CK
	16	29.443	29.552	83	79	83	WSW	5.4*	0.10	b, g	...	KS, CK
	31st	10	29.568	29.678	84	80	83	SSE	5.2*	0.40	...	C, CK
	June.	16	29.487	29.585	87	81	78	S	11.0*	...	b, g	...
	1st	10	29.610	29.719	89	82	77	S	6.5*	...	b, m	K
CUTTACK.	16	29.503	29.613	89	82	73	SW	17.1*	...	b, m	...	...
	2nd	10	29.623	29.733	88	83	73	S	8.5*	0.20	d	K, CK, KS
	16	29.587	29.694	88	82	80	S	13.1*	...	b, m	...	CS, KS
	3rd	10	29.686	29.794	90	83	73	S	5.6*	...	b	K
	16	29.542	29.650	91	83	70	SW	13.2*	...	b	...	K
	May.											
	28th	10	29.732	29.812	96	78	42	WSW	16*	...	b, c	...
	16	29.631	29.681	91	79	50	SSE	1.5*	...	b, m	...	...
	29th	10	29.764	29.794	93	74	63	SW	12*	...	b, c	...
	16	29.610	29.640	94	76	40	SSE	12*	...	b, c	...	...
ANJAPUR.	30th	10	29.680	29.716	95	73	31	WNW	10*	...	b, c	...
	16	29.580	29.599	91	77	50	E	9*	...	b, c	...	...
	31st	10	29.641	29.671	94	75	30	WNW	13*	...	m	...
	June.	16	29.541	29.571	92	76	45	SE	12*	...	b, c	...
	1st	10	29.633	29.683	96	74	31	NNW	7*	...	b	...
	16	29.551	29.681	91	78	53	SE by S	14*	...	b	...	...
	2nd	10	29.685	29.716	91	79	56	SSE	12*	...	b	...
	16	29.620	29.650	88	80	50	SE by S	18*	...	b, c	...	...
	3rd	10	29.724	29.754	90	80	63	SSE	12*	...	b, c	...
	16	29.608	29.638	89	78	62	SSW	16*	...	b, c	...	...

* Velocity of wind in miles per hour.

CALCUTTA.
The 4th June 1870.HENRY F. BLANFORD,
Meteorological Reporter to the Govt. of Bengal.

Weekly Report of Rainfall compiled at the Meteorological Reporter's Office.

CIRCLES.	STATIONS.	Rainfall from 16th to 22nd May 1870.	Rainfall from 23rd to 29th May 1870.	RAIN FROM 1ST JANUARY 1870.		REMARKS.
				Rain.	Up to date.	
SOUTH-WESTERN.	Poores ...	Nil	Not received	0.21	22nd May 1870.	
	Falsa Point ...	Not received	ditto	1.47	8th May 1870.	
	Cuttack { Telegraph Office ...	Nil	1.70	4.50	28th May 1870.	
	Cuttack { Jail ...	ditto	Not received	3.17	22nd May 1870.	
	Sambalpur ...	Not received	ditto	4.30	16th May 1870.	Not received 7th to 13th March, 11th to 17th April, and 25th April to 1st May.
	Balasore ...	0.20	ditto	4.32	22nd May 1870.	
	Midnapore ...	1.00	Not received	2.70	22nd May 1870.	
	Bancoora ...	1.10	0.50	3.25	20th May 1870.	
	Chyebassa ...	0.10	2.07	4.04	ditto.	
	Purulia ...	0.54	0.70	4.01	ditto.	
WESTERN.	Gobindpore ...	Not received	0.60	0.60	ditto	Not received 1st Jan. to 22nd May.
	Bardwan ...	Nil	0.50	3.70	ditto.	
	Ranegunga ...	1.41	0.05	3.04	ditto	Not received 2nd to 8th May.
	Sooree ...	Nil	2.43	2.00	ditto.	
	Deoghur ...	1.15	Not received	2.48	22nd May 1870.	
	Burkes ...	Nil	0.05	1.55	20th May 1870.	Not received 3rd to 10th Jan. and 7th Feb. to 6th March.
	Hazareebaugh ...	ditto	Nil	1.01	ditto.	Not received 1st Jan. to 20th March.
	Ranchee ...	ditto	0.48	1.13	ditto	Not received 1st Jan. to 27th March.
	Sasaram ...	0.10	Nil	0.50	ditto	
	Saugor Island ...	2.00	3.00	7.30	20th May 1870.	
CENTRAL.	Contai ...	Nil	1.53	2.48	ditto.	
	Calcutta ...	0.02	Nil	5.75	ditto.	
	Howrah ...	1.43	0.06	5.84	ditto.	
	Hooghly { Jail ...	2.01	Nil	7.03	ditto.	
	Hooghly { College ...	Not received	Not received	...	...
	Jessore ...	0.91	4.65	13.55	20th May 1870.	Not received 1st to 16th Jan. and 4th to 10th April.
	Kalnaghar ...	1.43	Not received	3.71	22nd May 1870.	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
	Kanaghat ...	0.72	1.83	3.45	20th May 1870.	Not received 1st to 6th Jan. and 4th to 10th April.
	Bongong ...	1.40	1.10	4.21	ditto	Not received 1st to 6th Jan. and 4th to 10th April.
	Moharpore ...	Not received	1.20	2.20	ditto	Not received 1st Jan. to 6th Feb. 4th to 10th April, and 16th to 22nd May. Not received 1st Jan. to 6th Feb. and 4th to 10th April.
NORTH-WESTERN.	Chondangab ...	1.10	3.80	5.50	ditto	
	Koeltes ...	0.20	Not received	3.23	22nd May 1870.	
	Berhampore ...	0.81	2.36	4.00	20th May 1870.	
	Furrespore ...	2.00	Not received	8.50	22nd May 1870.	
	Burrisaul ...	2.51	0.01	13.35	20th May 1870.	
	Itanagar ...	Nil	0.02	1.57	20th May 1870.	Not received 1st Jan. to 1st May.
	Mudheyppoonah ...	0.02	0.77	1.00	ditto	Not received 1st Jan. to 24th April.
	Banla ...	Not received	Not received	0.20	1st May 1870.	
	Monghyr ...	Nil	Nil	1.01	20th May 1870.	Not received 1st Jan. to 24th April.
	Jamouie ...	ditto	ditto	0.07	ditto	Not received 1st Jan. to 15th May.
NORTH-EASTERN.	Bogossari ...	0.06	Not received	0.06	22nd May 1870.	Not received 1st to 16th Jan. and 11th to 15th April.
	Gya ...	0.43	Nil	1.51	20th May 1870.	Not received 1st Jan. to 20th March.
	Behar ...	Nil	Not received	0.43	22nd May 1870.	
	Patna ...	0.09	ditto	0.00	ditto.	
	Bhubhoah ...	Nil	1.00	1.07	20th May 1870.	Not received 1st Jan. to 24th April.
	Darh ...	ditto	0.12	0.12	ditto	Not received 1st January to 15th May.
	Arrah ...	ditto	Nil	2.00	ditto.	
	Buxar ...	ditto	ditto	1.37	ditto.	
	Chuprah ...	0.20	ditto	0.00	ditto.	
	Sewau ...	0.07	ditto	0.07	ditto	Not received 1st Jan. to 1st Mar.
NORTH-CENTRAL.	Champaran ...	Not received	Not received	1.50	15th May 1870.	Not received 3rd to 16th Jan.
	Benares ...	ditto	ditto	0.51	ditto.	
	Mozufferpore ...	1.10	0.50	2.80	20th May 1870.	Not received 1st Jan. to 20th Feb.
	Dingpore ...	0.41	Nil	0.06	ditto	Not received 1st Jan. to 13th Feb.
	Rampore Beaulah ...	0.09	1.28	3.01	20th Mar 1870.	Not received 1st Jan. to 1st May.
	Natore ...	2.00	0.46	3.06	ditto	
	Poona ...	1.35	2.35	8.58	ditto.	
	Coimbatore ...	0.13	4.27	4.51	ditto	Not received 1st Jan. to 15th May.
	Serangap ...	2.11	Not received	2.11	22nd May 1870.	
	Alibet ...	0.23	0.12	1.30	20th May 1870.	Not received 1st to 9th Jan.
NORTH-EASTERN.	Bogra ...	Not received	Not received	3.11	1st May 1870.	Not received 1st to 9th Jan.
	Dinapore ...	0.09	ditto	4.48	22nd May 1870.	Not received 1st to 3rd Feb.
	Bangore ...	0.40	ditto	0.40	ditto	Not received 1st to 23rd Jan., 21st to 27th Feb., and 7th March to 3rd April.
	Buxa ...	Not received	ditto	10.90	30th April 1870.	
	Itanagar ...	ditto	ditto	12.45	ditto.	
	Darjeeling ...	1.47	ditto	13.50	22nd May 1870.	
	Gowalparah ...	5.38	Not received	11.57	22nd May 1870.	
	Gowhaty ...	6.20	ditto	14.00	ditto.	
	Shillong ...	1.83	ditto	8.25	ditto.	
	Nankow ...	Not received	ditto	3.40	30th April 1870.	Not received 2nd to 8th May.
NORTH-EASTERN.	Nongong ...	4.50	ditto	12.90	22nd May 1870.	
	Tezpor ...	5.10	ditto	13.10	ditto.	
	Dhobingah ...	5.42	ditto	15.43	ditto.	
	Sesbanur ...	1.90	ditto	16.50	ditto.	
	Debooghur ...	1.70	ditto	31.77	ditto.	Not received 1st to 6th January.
	Sambogooing ...	Not received	ditto	8.00	15th May 1870.	Not received 1st and 2nd Jan.
	Itan ...	0.40	Not received	4.05	22nd May 1870.	Not received 1st to 16th Jan. and 4th to 20th Feb.
	Mymensing ...	2.30	ditto	4.37	ditto	Not received 3rd to 9th Jan. and 29th March to 17th April.
	Sylhet ...	2.05	ditto	10.16	ditto.	
	Cherra Roanjo ...	Not received	ditto	...	...	Not received 2nd to 15th May.
EASTERN.	Cachar ...	2.24	ditto	0.24	22nd May 1870.	
	Aenakhail Hylakandy ...	0.34	ditto	8.41	ditto.	
	Typparah ...	1.05	ditto	7.00	ditto.	
	Nankail ...	1.90	ditto	5.30	ditto.	Not received 14th to 20th March.
	China { Telegraph Office ...	0.00	2.30	1.70	20th Mar 1870.	
	Long { Jail ...	1.05	Not received	0.75	22nd May 1870.	
	Rangamata Hill ...	Not received	ditto	8.40	15th May 1870.	
	Akyab ...	3.70	0.10	23.50	20th May 1870.	

Results of the Meteorological Observations taken at the Surveyor-General's Office, Calcutta, from 22nd to 31st May 1870.

MONTH.	Date.	Mean reduced Barometer.	THERMOMETER.		Max. Solar radiation.	Mean Dry Bulb.	Mean Wet Bulb.	Computed Mean Dew-point.	Mean degree of humidity.	WIND.			Rain.	GENERAL REMARKS.
			Highest Reading.	Lowest Reading.						Prevailing direction.	Max. pressure.	Daily velocity.		
		Inches.	°	°	°	°	°	°			in	Miles.	Inches	
May	22nd	29.633	92.2	75.5	124.0	85.2	80.0	76.4	0.70	S & S S W	3.8	350.2	...	Scuds and clouds of different kinds. Brisk wind between 9 & 10 A.M. & 2 1/2 P.M. Thunder at 9 1/2 P.M. Lightning from 9 to 11 P.M. Drizzled at noon, 2, & 11 P.M.
	23rd	29.680	93.2	76.0	127.8	85.3	79.8	75.9	.74	S S W	1.0	200.4	...	Clouds of different kinds. Lightning to W at 8 P.M. Drizzled at mid-night.
	24th	29.675	94.0	79.0	129.5	86.2	79.7	75.1	.70	S S W & S by E	1.0	234.0	...	Chiefly cumuli. Brisk wind between 1 & 3 A.M. Lightning to W at 8 P.M. Drizzled at 10 P.M.
	25th	29.692	95.4	80.5	133.0	87.2	80.0	77.1	.73	S S W, E by S, & S S E	...	233.0	...	Cirri and stratoni.
	26th	29.608	92.7	81.0	127.5	84.7	80.1	78.9	.78	S by W, S S W & S S E	...	277.3	...	Clear, cumuli, overcast, and stratoni.
	27th	29.634	91.5	79.5	115.5	81.3	79.7	76.6	.78	S S E & S S W	...	163.0	...	Clouds of different kinds. Lightning from 7 to 9 P.M. Drizzled at 7 1/2 P.M.
	28th	29.505	91.5	73.7	130.0	85.3	79.3	75.1	.72	S by W & variable	1.6	138.0	...	Overcast and cirro cumuli. Brisk wind between 7 & 8 P.M. Lightning from 8 to 10 P.M. Drizzled at 8 P.M.
	29th	29.528	89.7	80.5	...	81.7	80.2	77.0	.79	S S W & S by E	...	127.0	...	Overcast. Drizzled at 8 & 10 1/2 P.M.
	30th	29.407	90.0	80.0	127.7	84.9	79.5	75.7	.75	S S E & S	...	141.0	...	Chiefly overcast. Thunder & drizzled at 2 1/2 P.M.
	31st	29.474	100.9	78.0	131.8	87.7	79.7	74.9	.67	S E, S S E & S	...	153.0	...	Clear and cirri. Lightning to N. W. at 2 P.M.

The mean Barometer, as likewise the Dry and Wet Bulb Thermometer means, are derived from the twenty-four hourly observations made during the day.

The Dew-point is computed with the Greenwich constants.—The figures in column ten represent the humidity of the air, the complete saturation of which being taken at unity.—The receiver of the lower rain gauge is 1 1/2 feet, and that of the Anemometer 70 feet 10 inches, above the level of the ground.—The velocity of wind, as indicated by Robinson's Anemometer, is registered from noon to noon.

The extreme variation of temperature during the past ten days	...	25.4
The max. temperature during the past ten days	...	100.9
The max. temperature during the corresponding period of the past year	...	96.1
The mean humidity during the past ten days	...	0.74
The mean humidity during the corresponding period of the past year	...	0.74
		Inches.
The total fall of rain from 22nd to 31st	{ by lower rain gauge	Nil.
	{ by Anemometer gauge	Nil.
Ditto ditto, average of sixteen previous years	...	2.29
Ditto between the 1st January and the 31st ultimo	...	5.75
Ditto ditto ditto, average of 16 years...	...	10.53

GOPENAATH SEN,
In charge of the Observatory.

The 3rd June 1870.



SUPPLEMENT TO The Calcutta Gazette.

WEDNESDAY, JUNE 15, 1870.

OFFICIAL PAPERS.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT, separately, on payment of six Rupees per annum if delivered in Calcutta, or twelve Rupees if sent by Post.

Proceedings of the Council of the Lieutenant-Governor of Bengal for the purpose of making Laws and Regulations.

Saturday, the 11th June 1870.

Present:

HIS HONOR THE LIEUTENANT-GOVERNOR OF BENGAL, *presiding*.

J. GRAHAM, Esq., *Acting Advocate-General*,
THE HON'BLE ASHLEY EDEN,
A. MONEY, Esq., C.B.,
A. R. THOMPSON, Esq.,
V. H. SCHALCH, Esq.,

BABOO ONGCOOL CHUNDER MOOKERJEE,
BABOO CHUNDER MOHUN CHATTERJEE,
AND
BABOO JOTEENDRO MOHUN TAGORE.

CALCUTTA PORT IMPROVEMENT.

On the motion of Mr. Eden the Bill to appoint commissioners for making improvements in the Port of Calcutta was passed.

VILLAGE CHOWKEEDARS.

MR. RIVERS THOMPSON said that before moving that the Bill to provide for the appointment, dismissal, and maintenance of village chowkeedars be passed, he wished to suggest some amendments that had been brought to his notice during the period which had elapsed since the Bill was last under consideration. It had been represented to him by certain native gentlemen who were interested in this measure that the provisions of sections 3 and 4 of the Bill which limit the operation of the law to villages containing more than 60 houses or to unions of two or more villages containing together more than 80 houses, would interfere with the general extension of the benefits of the Act. It had been represented also that very often the inhabitants of villages of less than 60 houses would be anxious to secure the advantages of the proposed system, and the suggestion had been made that the Bill should provide for the extension of the law to places to which it would not now apply, on the expression of such a wish by the majority of the residents of any village. He would therefore move the introduction of the following section after section 4:—

"IVA. Whenever the majority in number of the adult male residents in any village, or in two or more villages so situate as in section IV. is set forth shall by a writing signed by them apply to the magistrate of the district for the appointment of a punchayet in such village or villages, it shall be lawful for him to appoint a punchayet under this Act in such village or villages without regard to the number of houses therein contained, and all the provisions of this Act shall apply to such punchayet and to such village or villages."

The motion was agreed to.

On the motion of MR. THOMPSON verbal amendments were made in section 47; and to schedule B, which specifies the offences to be reported by the chowkeedar and for which he may arrest, "culpable homicide" and "theft" were added.

MR. SCHALCH said that he had some amendments to move in the sections relating to the investigation of disputes relating to chowkeedaree chakran lands. Section 57 provided that a commission should be appointed for the determination of all disputes relating to chakran lands in the villages in which the Act was introduced. But no provision was made for determining such disputes relative to chakran lands as might exist in villages in which, owing to an insufficient number of houses, no punchayet was appointed. It was true that these lands might remain secured for the services of the officer who reported crime to the police and kept watch in the village and performed certain services for the zemindar; but if some provision was not made for ascertaining and recording these lands, they might disappear in the same way as the council had been told chakran lands in some places had already disappeared. He would therefore suggest that the commission appointed to investigate disputes regarding chakran lands, in which a punchayet had been appointed, should also be empowered to settle disputes regarding these lands in other villages, so that the lands could be brought under registry, and the magistrate could see that they were kept for the purpose for which they were assigned.

MR. SCHALCH then moved amendments in sections 57, 58, and 60; which made the sections stand thus, the amendments being printed in italics:—

"LVII. In any district or part of a district in which may be situated lands before the passing of this Act assigned for the maintenance of an officer to keep watch in any village and to report crime to the police, it shall be lawful for the Lieutenant-Governor of Bengal, by an order to be published in the Calcutta Gazette, to appoint a commission consisting of one or more persons, to ascertain and determine the chowkeedaree chakran lands and other lands before the passing of this Act assigned for the maintenance of an officer to keep watch in any village and to report crime to the police in such district."

"LVIII. Whenever in any district in which such commission shall have been appointed any question shall arise whether any or what lands are chowkeedaree chakran lands or other lands before the passing of this Act assigned for the maintenance of an officer to keep watch in any village and to report crime to the police, it shall be lawful for such commission to enquire into such question."

"LX. Such commission shall demarcate the boundaries of any lands which they may determine to be chowkeedaree chakran lands or other lands before the passing of this Act assigned for the maintenance of an officer to keep watch in any village and to report crime to the police, and shall make orders under their hand setting forth the land which they shall have determined to be chowkeedaree chakran lands or other lands as aforesaid, and the boundaries thereof and the name of the village for the benefit of which such land are assigned, and distinguishing whether such lands be or be not chowkeedaree chakran lands or other lands as aforesaid. Every such order shall be final and conclusive respecting all matters hereinbefore required to be set forth in such order so far as the same shall be therein set forth."

MR. THOMPSON said that in consequence of the omission from the Bill of the sections regarding the appointment of manduls in villages in which punchayets were not appointed, it would be necessary to introduce a section declaring the liability of zemindars under the old regulations to remain intact. He would therefore move the introduction of the following section after section 64:—

"Nothing in this Act contained shall diminish or in any way affect any liability, duty, or obligation of any zemindar under any law in force at the time of the passing of this Act to report crimes or offences occurring within his estate or tenure."

The motion was agreed to.

On the motion of Mr. Schalch the following section was introduced after the above:—

"Nothing in this Act contained, save the provisions of sections LVII, LVIII, LIX and LX, shall affect any lands before the passing of this Act assigned for the maintenance, in any village in which a punchayet may not be appointed, of an officer to keep watch in such village and to report crime to the police, and every such officer in such village shall be bound to perform the same duties and shall have the same rights unto such lands and may be removed and a successor to him appointed as if this Act had not been passed."

BABOO ONOOGOO L CHUNDER MOOKERJEE said there was in the original Bill a provision that the chowkeedar should keep watch in the village. The select committee had, however, omitted that provision from the Bill. But as he had been informed that the villagers were very anxious that the chowkeedar should act as a preventive as well as detective officer, he would move an amendment to the 7th clause of section 38, so that it should stand thus:—

"7th. He shall obey the orders of the punchayet in regard to keeping watch in the village and other matters connected with his duties as chowkeedar."

BABOO JOTRENDRO MOHUN TAGORE said that he would support the amendment. The Bill originally contemplated that the chowkeedar should keep watch and ward in the village, and he did not see why the chowkeedar should not be bound to do so: the more so as the villagers were going to pay a certain amount of tax for the maintenance of the chowkeedar, and they should not be deprived of the security afforded by the chowkeedar keeping watch in the village.

The motion was agreed to.

On the motion of Mr. Thompson the Bill was then passed.

DACCA CONSERVANCY.

On the motion of MR. EDEN the report of the select committee on the Bill for improving the sanitary condition of the town of Dacca was taken into consideration in order to the settlement of the clauses of the Bill.

The Bill was agreed to without amendment, and was then passed.

The council was adjourned *sine die*.

Annual Report of the Comillah Municipality for the year 1869-70.

From R. L. MANGLES, Esq., Officiating Commissioner of the Chittagong Division, to the Secretary to the Government of Bengal, Judicial Department,—(No. 197, dated Chittagong, the 30th May 1870.)

I HAVE the honor to submit the accompanying copy of the annual report No. 129 of the 18th instant, together with a statement of the accounts of the Comillah municipality for the year 1869-70.

2. It will be observed that the financial position of the municipality continues to improve, and that the receipts of the year under review exceeded those of the previous year by Rs. 903.

3. It is also satisfactory to observe that the meetings have been better attended, and that greater interest has been taken in the affairs of the municipality by the commissioners than heretofore.

4. The number of deaths registered amounted to 127 as against 122 of the previous year. If the census has been correctly held, the death-rate per 1,000 inhabitants is low, and speaks well for the sanitary condition of the town.

5. It appears to me that the charges on account of municipal police and office establishment are disproportionately heavy to the income of the municipality, and I have addressed the chairman of the commissioners on the subject with a view to a reduction of these charges if possible.

From R. D. HINE, Esq., Chairman of the Municipal Committee, Tipperah, to the Commissioner of the Chittagong Division,—(No. 129, dated Comillah, the 18th May 1870.)

I HAVE the honor to submit the usual annual administration report of the Comillah Municipality for the year 1869-70.

Receipts.

The balance brought from last account was Rs. 791-8-10 against Rs. 664-14-1 for the year 1868-69.

The collection of the tax on houses and land amounted to Rs. 7,738-4-5 against Rs. 7,203-4-3 for the preceding year.

The sum received under the heading of cattle fine was Rs. 396-0-3 against Rs. 387-3-9 for the last year.

The conservancy fines realized during the year amounted to Rs. 59-16-6 against Rs. 66-7-6 for the former year.

The miscellaneous receipts for this year were Rs. 444-11 against Rs. 69-0-8 for the last year.

The total amount available for municipal purposes during the year amounted to Rs. 9,430-8 against Rs. 8,390-13-10 for the year 1868-69.

Disbursements.

The charges incurred in collecting the tax for the year amounted to Rs. 192, being the same as in last year.

The conservancy charges amounted to Rs. 2,683-11 against Rs. 2,257-3-3 for the preceding year.

The charges for the maintenance of the municipal police was Rs. 2,370-4-9 against Rs. 1,584 for the year 1868-69; this increase is owing to the formation of a municipal constabulary police with increased pay, and to the erection of twelve accommodation huts for the guards, and the purchase of accoutrements, &c.

A sum of Rs. 924-12 was expended in repairing and dressing twenty-six roads.

A sum of Rs. 32-14 was expended in repairing municipal office bungalow and Rs. 10-14 in repairing two cattle pounds.

A sum of Rs. 189-5-6 in buying and refitting a ferry boat for sudder ferry ghât, this sum was afterwards realized from the farmer of the ghât and credited under the heading of miscellaneous receipts.

A subscription to charitable hospital for the year was Rs. 192, at Rs. 16 per mensem, and half pay of vaccinator, at Rs. 5 per mensem, the excess expenditure Rs. 30; as shown in this heading, was paid into the treasury under order of Government as half pay of the vaccinator for a portion of the preceding year.

A sum of Rs. 24-8 was spent in rewards for killing pariah dogs which had become a great nuisance from their numbers, and the prevalence of hydrophobia among them.

A sum of Rs. 785-4 was expended this year in local improvements. Of this sum Rs. 485-4 were spent in making and burning bricks for the purpose of metalling roads, and Rs. 270 in excavating two tanks and opening a road; part of this sum will be recovered from the proprietors of the tanks; Rs. 30 in making two new bridges.

The charge for the office establishment was Rs. 1,460-1-0 against Rs. 1,620 for the preceding year; this reduction is owing to the reduction of the pay of the municipal clerk.

The contingencies amounted to Rs. 230.

The balance in the treasury at the disposal of the municipal commissioners amounted to Rs. 232-13-8.

General Remarks.—Sanitary, &c.

The meetings, as a rule, have been better attended than they were during the preceding year, and more interest has been shewn by the members in discussing and criticising measures of conservancy, but little active assistance has been given to the chairman and vice-chairman in municipal work. As regards the sanitation of the town I consider it to be gradually improving, there being less jungle and weeds about the station than formerly. The experiment of gratuitous distribution of vegetable seeds last year had a good effect; this year, though no such distribution took place, many persons made neat vegetable gardens in clearings about their dwellings. Such has been the enthusiasm for horticultural pursuits that, incredible as it may appear, I have seen an English speaking Baboo and a Brahmin working with their own hands among their cabbages in the cool of the morning.

Several new roads and paths have been opened or repaired during the year, and the usual conservancy operations of cleaning tanks and drains, carting away rubbish, cutting jungle, &c., carried on. The census of the town was taken, giving a total population of 10,619. The number of deaths registered during the year was 127.

I regret to have to record the death of the municipal overseer, Mr. Sullivan, who was accidentally drowned in the river Goomtee near Dacookandy in April last. The municipality sustains a great loss in this officer, who discharged his duties most carefully and efficiently. Baboo Tarak Chundra Gupta, late municipal clerk, has been appointed in his place, on probation, on a salary of Rs. 50 per mensem and Rs. 15 horse allowance.

Municipal Improvement Fund under Act III. of 1864, for the year 1869-70.

	Rs. As. P.	Rs. As. P.		Rs. As. P.	Rs. As. P.
To balance brought from last account	...	791 8 10	Charges incurred in the collection of the rate of 7 per cent. upon the annual value of houses, buildings, and land	192 0 0	192 0 0
To amount collected on account of the rate of 7 per cent. upon the annual valuation of houses, buildings, and land	7,788 4 5		Conservancy charges	2,688 11 0	2,688 11 0
Cattle line	398 0 3		Amount paid to the district treasury for the maintenance of police under Section 34 of Act III. of 1864	3,370 4 9	3,370 4 9
To amount collected on account of fines, &c., under Act III. of 1864	59 16 0		Amount expended for repairing the following roads:—		
To amount collected on account of miscellaneous receipts	444 11 0	8,619 15 2	Captain Bazar Road	64 5 6	
			Churtah Road	74 4 0	
			Ballotopah Road	36 0 0	
			Natunah Diggy Road	34 8 0	
			Thomson's Road	2 1 0	
			Onthar Churtah Road	96 3 0	
			Moordpoor Road	74 4 0	
			Gang Chur Road	33 6 0	
			Tiera Chur Road	169 5 0	
			Delaney's Road	33 16 0	
			Daklin Churtah Road	141 9 0	
			Juggut Moonshee's Road	34 12 6	
			Anyeoomah Road	1 14 0	
			Shacongacha Road	1 6 0	
			Dhurinopoor Road	2 10 0	
			Bhatparah Road	1 6 0	
			Shungurish Road	5 10 0	
			Gobindpoor Road	5 1 0	
			Chittagong Road	26 8 0	
			Raujunge Road	0 9 0	
			Shutter Kutton Road	25 8 0	
			Shoeju Gangi Road	8 0 0	
			Ferry Ghāt Road	30 18 0	
			Tinnuah Ghāt Road	8 12 0	
			Telekoonah Road	5 10 0	
			Kashareepotho Road	17 13 0	224 12 0
			Repairing Municipal Office	23 14 0	22 14 0
			Repairs of two Cattle Pounds	10 14 0	10 14 0
			Cost of Ferry Boat for Sudder Ferry Ghāt	189 5 6	189 5 6
			Subscription to Charitable Hospital	192 0 0	192 0 0
			Pay of Vaccinator	90 0 0	90 0 0
			Reward for killing peevish Dogs	24 8 0	24 8 0
			Local Improvements	735 4 0	735 4 0
			Municipal Office Establishment	1,460 1 6	1,460 1 6
			Contingencies	230 0 0	230 0 0
			Balance on the 31st March 1870	...	239 13 3
Total	...	8,430 8 0	Total	...	8,430 8 0

R. D. HINE,
Chairman.

TIPPERAH MUNICIPALITY,
The 17th May 1870.

Meteorological Telegraphic Report for the period 4th to 10th June 1870.

STATIONS.	Date.	Hour.	Barometer reduced to 85°.	Barometer reduced to sea-level.	THERMOMETER.		Humidity Sat. = 100.	WIND.		Rain.	Weather initials.	Clouds.	
					Dry.	Wet.		Direction.	Velocity.				
CALCUTTA.	June.				E	E	78	S	...	...	...	K, seeds from S.
	4th	10	29.695	29.713	29.7	81.7	61	S by E	...	...	...	K
	18	29.680	29.694	29.7	82.4	69	S by W	...	...	...	...	K
	6th	10	29.707	29.725	29.7	82.4	69	S	...	...	...	K
	18	29.623	29.641	29.4	81.5	60	S	...	...	...	...	K
	8th	10	29.788	29.780	29.7	82	61	S by W	K
	18	29.643	29.661	29.6	81.3	60	S S W	...	...	...	...	K
	7th	10	29.720	29.738	29.0	82	73	S S W	K
	18	29.580	29.614	29.6	82	63	S S W	...	...	...	...	CS
	8th	10	29.615	29.663	29.6	81.0	60	S S W	CK
18	29.531	29.549	29.5	81.2	67	S S W	...	...	...	...	C	
9th	10	29.650	29.668	29.6	81.0	63	S S W	...	...	...	...	CK & seeds from SSW,
10th	18	29.635	29.653	29.7	81.7	58	S by W	...	...	...	...	C
10th	10	29.704	29.722	29.7	82.4	70	S S W	...	...	0.63	...	CS, & seeds from SSW
18	29.613	29.631	29.5	81.5	60	S by W	...	...	...	...	...	K, C
4th	10	29.719	29.725	29.5	80	81	S S W	2	0.10	b	...	N	
18	29.618	29.624	29.0	84	78	S S W	3	...	b	...	...	N
5th	10	29.710	29.724	29.0	84	76	S S W	3	...	b	...	N	
18	29.654	29.660	29.0	84	78	S S W	3	...	b	...	...	N
6th	10	29.705	29.811	29.0	84	78	S W	3	...	b	...	N	
18	29.641	29.647	29.0	84	75	S W	3	...	b	...	...	N
7th	10	29.753	29.761	29.0	83	70	S W	3	0.10	b	...	CS	
18	29.645	29.651	29.0	84	76	S W	3	...	b, m, w	...	...	N
8th	10	29.687	29.703	29.0	84	80	W S W	4	...	b	...	CS	
18	29.600	29.606	29.0	84	78	W S W	3	...	b	...	...	N
9th	10	29.670	29.685	29.0	84	76	W S W	3	...	b	...	CS	
18	29.587	29.573	29.0	84	76	S S W	3	...	b	...	...	N
10th	10	29.745	29.741	29.0	84	76	W S W	2	...	b	...	C	
18	29.645	29.651	29.0	84	76	S S W	3	...	b	...	...	C
4th	10	29.684	29.703	29.0	82	73	S	6.40	...	b	...	CK	
18	29.620	29.710	29.0	82	60	S S W	12.40	...	b	...	...	K
5th	10	29.650	29.807	29.0	81	60	S S E	7.70	...	b	...	K	
18	29.651	29.759	29.0	82	60	S S W	14.40	...	b	...	...	K
6th	10	29.746	29.655	29.0	82	76	S W	8.70	...	b	...	K, CS	
18	29.713	29.822	29.0	81	60	S S E	16.40	...	b	...	...	K
7th	10	29.709	29.813	29.0	81	76	S S W	8.00	1.00	b, w	...	CS	
18	29.637	29.740	29.0	82	73	S W	18.10	...	b, w	...	...	K
8th	10	29.646	29.755	29.0	82	73	S S E	8.00	0.20	b	...	K	
18	29.574	29.643	29.0	80	60	S W	14.40	...	b	...	...	K
9th	10	29.672	29.782	29.0	82	61	S	8.30	0.10	b, m, w	...	N	
18	29.603	29.713	29.0	81	67	S S E	8.70	...	m	...	...	CS
10th	10	29.709	29.818	29.0	83	73	S S E	4.00	...	b	...	...
18	29.624	29.732	29.0	83	73	S W	13.00	...	b	...	...	K
4th	10	29.730	29.760	29.0	81	67	S	10.00	...	b	...	...
18	29.607	29.637	29.0	79	62	S E	16.00	...	b	...	...	...
5th	10	29.710	29.740	29.0	79	47	S by W	7.00	...	b	...	...
18	29.627	29.657	29.0	78	60	S E	12.00	...	b	...	...	...
6th	10	29.747	29.817	29.0	77	68	S S W	7.00	...	b	...	...
18	29.612	29.722	29.0	77	61	S E by S	12.00	...	b	...	...	...
7th	10	29.787	29.797	29.0	76	40	N W	8.00	...	b	...	...
18	29.641	29.711	29.0	79	62	S E by S	14.00	...	b	...	...	...
8th	10	29.753	29.782	29.0	76	45	W N W	7.00	0.01	b	...	...
18	29.593	29.693	29.0	79	47	E	10.00	...	b	...	...	...
9th	10	29.712	29.742	29.0	75	40	W N W	9.00	...	b	...	...
18	29.574	29.640	29.0	83	58	S E	13.00	...	b	...	...	...
10th	10	29.741	29.751	29.0	76	45	N	8.00	...	b, m	...	...
18	29.629	29.659	29.0	78	63	E	11.00	...	b	...	...	...
4th	10	29.639	29.720	29.0	85	73	S	13.00	...	m	...	CS	
18	29.504	29.585	29.0	83	63	S E	14.40	...	m, l, r	...	...	CK, CS
5th	10	29.664	29.737	29.0	83	64	S by E	15.70	...	m	...	CK	
18	29.579	29.609	29.0	83	66	S	24.40	...	m	...	...	CK
6th	10	29.736	29.817	29.0	83	61	S W	17.30	...	m	...	CK, CS	
18	29.640	29.690	29.0	83	68	S by E	24.30	...	m	...	...	CK
7th	10	29.701	29.772	29.0	83	67	S E	30.40	...	m	...	CS, K	
18	29.549	29.630	29.0	82	55	S	25.30	...	m, l, r	...	...	CK, K
8th	10	29.654	29.739	29.0	85	67	S	28.30	...	m	...	CK, CS	
18	29.548	29.597	29.0	83	53	S E	29.20	...	m, t	...	...	CK, N, CS
9th	10	29.636	29.717	29.0	82	64	S by E	25.20	...	b	...	...
18	29.490	29.590	29.0	81	50	S	24.30	...	b	...	...	C
10th	10	29.686	29.767	29.0	82	58	S W	22.00	...	m	...	CK, E	
18	29.510	29.601	29.0	79	46	N W	31.00	...	m, w, r, t	...	...	CK, N
4th	10	29.603	29.678	29.0	79	63	N W	1	2.50	b	...	K, CS	
18	29.719	29.734	29.0	81	63	...	...	...	b	...	...	C, CS
5th	10	29.734	29.749	29.0	83	63	N N W	1	...	b	...	C, CS	
18	29.740	29.761	29.0	81	70	N W	1	...	...	...	...	K, CK
6th	10	29.815	29.910	29.0	81	79	N W	1	...	...	...	K, CK
18	29.647	29.692	29.0	85	80	Calm	...	...	b	...	...	E, CS, CK
7th	10	29.855	29.870	29.0	70	87	S S E	1	...	b	...	K, CS, CK	
18	29.738	29.753	29.0	85	81	S S E	1	...	b	...	...	CK, CS
8th	10	29.803	29.818	29.0	80	87	Calm	...	0.20	g	...	E, CS	
18	29.680	29.704	29.0	85	81	Calm	...	0.50	g	...	...	K, CS
9th	10	29.745	29.760	29.0	83	84	S S E	1	...	b	...	K, CS	
18	29.601	29.706	29.0	83	80	S W	1	...	b	...	...	K, CS
10th	10	29.811	29.815	29.0	84	83	S S E	1	...	b, t	...	C, CS	
18	29.736	29.751	29.0	81	79	Calm	...	...	b	...	...	C, CK, S

* Velocity of wind in miles per hour.

CALCUTTA,
The 11th June 1870.HENRY F. BLANFORD,
Meteorological Reporter to the Govt. of Bengal.

Weekly Report of Rainfall compiled at the Meteorological Reporter's Office.

Circuit.	STATIONS.	Rainfall from 23rd to 24th May 1870.	Rainfall from 24th May to 25th June 1870.	RAIN FROM 1st JANUARY 1870.		REMARKS.
				Rain.	Up to date.	
SOUTH-WESTERN.	Poorce ...	Nil	Not received	0.21	29th May 1870.	
	False Point ...	0.50	ditto	2.00	ditto.	
	Cuttack { Telegraph Office ...	1.70	0.50	5.00	5th June 1870.	
	{ Jail ...	1.85	Not received	5.02	29th May 1870.	
	Sunbulpore ...	Nil	ditto	4.80	ditto.	Not received 7th to 18th March, 11th to 17th April, and 25th April to 1st May.
	Bahazore ...	0.75	ditto	5.57	ditto.	
	Midnapore ...	0.90	ditto	3.90	ditto.	
	Bancoorah ...	0.50	1.30	4.53	5th June 1870.	
	Chyabussa ...	2.07	0.53	5.17	ditto.	
	Parola ...	0.70	0.02	4.03	ditto.	
WESTERN.	Gohindpore ...	0.60	0.29	0.08	ditto.	Not received 1st Jan. to 22nd May.
	Borowan ...	0.50	2.10	5.93	ditto.	
	Banoochanga ...	0.05	0.80	4.53	ditto.	Not received 2nd to 8th May.
	Sooree ...	2.43	1.18	4.07	ditto.	
	Deoghur ...	0.20	Nil	2.74	ditto.	
	Barhee ...	0.05	ditto	1.55	ditto.	
	Hazareebangh ...	Nil	0.01	1.94	ditto.	Not received 3rd to 16th Jan. and 7th Feb. to 6th March.
	Ranchee ...	0.48	0.22	1.35	ditto.	Not received 1st Jan. to 20th March.
	Haogran ...	Nil	Nil	0.50	ditto.	Not received 1st Jan. to 27th March.
	Saugor Island ...	0.00	0.51	7.80	ditto.	
CENTRAL.	Contai ...	1.63	0.51	2.08	ditto.	
	Calcutta ...	Nil	2.79	8.54	ditto.	
	Howrah ...	0.00	1.09	7.55	ditto.	
	Boughly ...	Nil	0.52	8.05	ditto.	
	Jessore ...	4.95	0.81	14.30	ditto.	
	Kishanaghar ...	1.71	2.08	7.48	ditto.	Not received 1st to 10th Jan. and 4th to 10th April.
	Kanagbat ...	1.88	1.20	4.65	ditto.	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
	Bongong ...	1.10	0.05	5.10	ditto.	Not received 1st to 6th Jan. and 4th to 10th April.
	Meharpore ...	1.20	0.70	3.00	ditto.	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
	Choudangah ...	8.80	1.50	7.00	ditto.	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
NORTH-WESTERN.	Koushtia ...	3.10	2.40	8.73	ditto.	
	Berhampore ...	2.46	0.06	4.66	ditto.	
	Farrukpore ...	7.20	0.10	15.80	ditto.	
	Burrowal ...	0.01	0.40	13.81	ditto.	
	Bhangulore ...	0.02	Nil	1.67	ditto.	
	Mudhoypoorah ...	0.77	ditto	1.69	ditto.	Not received 1st Jan. to 1st May.
	Banka ...	Not received	1.00	1.20	ditto.	Not received 1st Jan. to 24th April and 23rd to 24th May.
	Monghyr ...	Nil	Nil	1.01	ditto.	Not received 1st Jan. to 24th April.
	Jamoua ...	ditto	2.18	2.23	ditto.	Not received 1st Jan. to 15th May and 23rd to 20th May.
	Ikgousari ...	Not received	0.03	0.09	ditto.	Not received 1st to 15th Jan. and 11th to 15th April.
NORTHERN.	Gya ...	Nil	Nil	1.51	ditto.	Not received 1st Jan. to 20th March.
	Belur ...	0.35	ditto	0.78	ditto.	
	Patna ...	0.15	ditto	1.05	ditto.	
	Shubhoush ...	1.01	Not received	1.00	29th May 1870.	Not received 1st Jan. to 24th April.
	Barh ...	0.12	0.00	0.22	5th June 1870.	Not received 1st January to 15th May.
	Arrah ...	Nil	Nil	2.00	ditto.	
	Buxar ...	ditto	ditto	1.37	ditto.	
	Chuprah ...	ditto	ditto	0.00	ditto.	
	Sewan ...	ditto	0.21	0.44	ditto.	Not received 1st Jan. to 1st May.
	Champuram ...	1.31	Not received	3.80	29th May 1870.	Not received 3rd to 10th Jan.
NORTH-EASTERN.	Benares ...	Nil	ditto	0.51	ditto.	
	Muzaffarpore ...	0.50	0.50	3.40	5th June 1870.	Not received 1st Jan. to 24th Feb.
	Dinapore ...	Nil	Nil	0.94	ditto.	Not received 1st Jan. to 17th Feb.
	Kanpore Benaulah ...	1.28	0.61	3.03	ditto.	
	Natore ...	0.16	1.41	4.47	ditto.	Not received 1st Jan. to 1st May.
	Patna ...	2.35	Not received	8.54	20th May 1870.	
	Commercelly ...	4.27	2.08	7.17	5th June 1870.	Not received 1st Jan. to 15th May.
	Seraingunge ...	0.11	0.33	7.55	ditto.	
	Madina ...	0.12	0.72	2.03	ditto.	
	Bogra ...	1.70	0.10	8.00	ditto.	Not received 1st to 9th Jan.
SOUTH-EASTERN.	Dinapore ...	0.00	2.33	7.41	ditto.	Not received 14th to 24th Feb.
	Bangpore ...	10.20	Not received	10.80	29th May 1870.	Not received 19th to 23rd Jan., 21st to 27th Feb., and 7th March to 3rd April.
	Buxa ...	Not received	ditto	10.90	30th April 1870.	
	Kanghee ...	ditto	ditto	12.45	ditto.	
	Darjeel. { Telegraph Office ...	ditto.	ditto	13.51	15th May 1870.	
	{ Jail ...	4.05	0.62	18.23	5th June 1870.	
	Gowainpore ...	0.79	7.00	10.45	ditto.	
	Gowhatty ...	Nil	Not received	14.90	20th May 1870.	
	Shillong ...	2.05	ditto	10.31	ditto.	
	Nanklow ...	Not received	ditto	3.40	30th April 1870.	
SOUTH.	Nowgong ...	1.00	ditto	14.80	29th May 1870.	Not received 2nd to 8th May.
	Tezpur ...	3.90	ditto	22.00	ditto.	
	Shoblong ...	1.00	ditto	16.48	ditto.	
	Sebsagar ...	2.00	ditto	14.50	ditto.	
	Debroogher ...	Not received	ditto	31.17	22nd May 1870.	Not received 1st to 9th January.
	Samooogooling ...	1.50	ditto	11.00	20th May 1870.	Not received 1st and 2nd Jan.
	Dacca. { Telegraph Office ...	Not received	ditto	4.17	3rd April 1870.	
	{ Jail ...	3.20	ditto	7.25	20th May 1870.	Not received 16th to 18th Jan. and 14th to 20th Feb.
	Myinsang ...	1.80	ditto	6.17	ditto.	Not received 3rd to 9th Jan. and 20th March to 17th April.
	Sylhet ...	7.26	ditto	17.43	ditto.	
SOUTH-EASTERN.	Cachar ...	4.37	ditto	14.01	ditto.	
	Assamhill Hylakandy ...	4.08	ditto	13.07	ditto.	
	Tipparah ...	4.15	ditto	11.15	ditto.	
	Nankhully ...	1.30	ditto	8.90	ditto.	Not received 14th to 25th March.
	Chitra. { Telegraph Office ...	2.40	1.10	14.00	5th June 1870.	
	{ Jail ...	1.78	Not received	8.54	20th May 1870.	
	Gangamaten Hill ...	2.60	ditto	12.50	ditto.	
	Atyah ...	9.10	4.10	27.50	5th June 1870.	

Mean Pressures and Temperatures of the preceding Table reduced to sea level, with mean Wind direction.

STATIONS.	Mean Barometric pressure reduced to sea level.	Mean Temperature reduced to sea level.	Proportional prevalence Max=100.	Mean direction.
Port Blair	29.872	79.9	47	N 48° E
Madras	29.907	80.0	33	S 60° E
Akyab	29.880	80.6	22	N 30° E
Pulac Point	29.934	81.1	33	S 62° W
Cuttack	29.908	81.5	22	S 83° W
Pangor Island	29.889	82.0	27	S 81° W
Chittagong	29.858	81.7	23	N 73° W
Calcutta	29.858	82.0	33	S 55° W
Jessore	29.851	81.9	12	N 56° W
Dacca	29.855	79.7	22	S 72° W
Chunar	29.868	79.1	23	S 76° W
Manerobaugh	29.849	80.7	31	N 67° W
Berhampore	29.845	82.4	27	S 60° W
Patna	29.855	78.8	33	N 64° W
Mugherr	29.824	78.0	30	S 47° W
Darjeeling	29.865	72.8	17	S 70° W
Gowalparah	29.868	77.0	6	S 76° E
Shillong	29.805	76.5	37	S 81° W
Bomarc	29.691	78.0	12	N 83° W

NOTE.

Barometric Pressure.—The pressures in column 2 of the above Table for all stations below 500 feet are reduced from those given in column 3 of the Table on the previous page by adding the weight of a column of air of the corresponding temperatures given in column 17. For stations of above 500 feet elevation, the reduction is made by Dippe's Tables as given in Guyot's "Meteorological and Physical Tables."

Temperature.—The temperatures in column 3 are reduced from those in column 17, on the preceding page, by adding 1° Fahr. for every 350 feet.

Wind Direction.—The mean wind direction and its comparative prevalence are calculated from the whole number of wind observations recorded during the half-month. The latter is given as a percentage of the whole number of observations. The mean direction is calculated in the usual way by Lambert's formula.

The above being all comparable, afford the data for constructing a meteorological chart for the half-month which shall shew the isobaric and isothermal lines, and the resultant wind directions, which last may be represented by arrows of varying length proportioned to the prevalence of the wind. To these may be added the rainfall from the previous Tables.

HENRY F. BLANFORD,

Meteorological Reporter to the Government of Bengal.

Results of the Meteorological Observations taken at the Surveyor-General's Office, Calcutta, from 1st to 7th June 1870.

Month.	Date.	Mean reduced Barometer.	THERMOMETER.		Max. Solar radiation.	Mean Dry Bulb.	Mean Wet Bulb.	Computed Mean Dew-point.	Mean degree of humidity.	WIND.			Rain.	GENERAL REMARKS.
			Highest Reading.	Lowest Reading.						Prevailing direction.	Max. pressure.	Min. velocity.		
June	1st	29.542	97.6	76.6	131.2	87.0	80.7	78.0	0.73	variable	4.8	276.8	11.3	Clear and clouds of different kinds. Brisk wind at 8½ p.m. Thunder at 9 & 9 p.m. Lightning from 7 to 9 p.m. Rain from 8 to 10 p.m. Overcast and cumuli. Brisk wind at 8½ p.m. Drizzled at 8½ & 10 p.m.
	2nd	590	92.6	78.0	129.8	84.4	79.0	76.2	.77	E by S & S by W	2.8	258.6	...	Overcast and cumuli. Brisk wind at 8½ p.m. Drizzled at 8½ & 10 p.m.
	3rd	511	95.0	77.6	130.0	80.2	80.8	77.1	.73	S S W & S	4.2	197.0	1.65	Clouds, cumuli and cumuli. Brisk wind at 9½ p.m. Lightning at 9½ and 10 p.m. Rain at 9 & 10 p.m.
	4th	627	95.0	80.6	129.8	87.1	81.9	78.0	.76	S by E & S	...	233.1	...	Cumuli and clear.
	5th	601	99.8	82.0	130.0	87.2	81.5	77.1	.75	S & S by E	1.9	267.3	...	Clear and cumuli.
	6th	711	93.4	79.5	124.8	87.3	80.7	78.7	.71	S & S S W	1.9	324.7	...	Clear and cumuli. Brisk wind from noon to 3 p.m. Thunder at 10 p.m. Lightning from 9 to 11 p.m. Drizzled at 8 a.m. & 9½ p.m.
	7th	608	12.3	80.0	124.0	80.2	80.2	76.0	.72	S by E, S S W & S by W	0.6	304.1	...	Stratocumuli and clear. Brisk wind from 10 a.m. to 4 p.m.

The mean Barometer, as likewise the Dry and Wet Bulb Thermometer means, are derived from the twenty-four hourly observations made during the day.

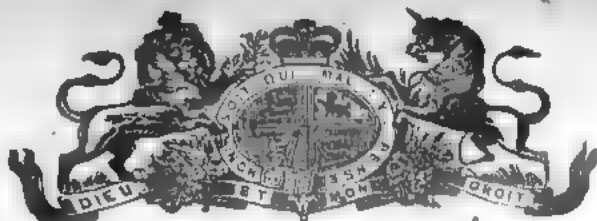
The Dew-point is computed with the Greenwich constants.—The figures in column ten represent the humidity of the air, the complete saturation of which being taken at unity.—The receiver of the lower rain gauge is 1½ feet, and that of the Anemometer 70 feet 10 inches, above the level of the ground.—The velocity of wind, as indicated by Robinson's Anemometer, is registered from noon to noon.

The extreme variation of temperature during the past seven days	...	21.0
The max. temperature during the past seven days	...	97.6
The max. temperature during the corresponding period of the past year	...	98.0
The mean humidity during the past seven days	...	0.74
The mean humidity during the corresponding period of the past year	...	0.72
		Inches.
The total fall of rain from 1st to 7th	{ by lower rain gauge	2.79
	{ by Anemometer gauge	2.30
Ditto ditto, average of sixteen previous years	...	2.24
Ditto ditto, between the 1st January and the 7th current	...	8.54
Ditto ditto ditto, average of 16 years...	...	13.07

GOVERNMENT SEN,

In charge of the Observatory.

The 10th June 1870.



SUPPLEMENT TO The Calcutta Gazette.

WEDNESDAY, JUNE 22, 1870.

OFFICIAL PAPERS.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT, separately, on payment of six Rupees per annum if delivered in Calcutta, or twelve Rupees if sent by Post.

Orissa Coast and River Survey.

From C. A. HARRIS, Esq., Orissa Survey, to CAPTAIN T. M. PHILBRICK, Officiating Master Attendant,—(No. 315, dated Calcutta, the 10th May 1870.)

I HAVE the honor herewith to submit a detailed report of the operations of the Orissa coast and river survey from 1st September 1868 to 30th April 1870.

On the 2nd September 1868 I left Calcutta for Orissa, taking with me Mr. J. H. Nickels as assistant surveyor, and four natives, being a portion only of the sanctioned establishment; it being arranged that a small screw steamer was to be sent down to me as soon as possible, and that in the meantime I was to work with boats and such assistance as I could get from the *Teesta* in the intervals of her regular work.

On arriving at False Point, Mr. Nickels was left on board the hulk to prepare for the survey, while I proceeded up to Cuttack to communicate with the authorities there, and obtain all possible information about the various creeks and rivers to be surveyed.

On arrival in Cuttack I was treated with the greatest courtesy, and met with every assistance in the way of maps and records of former reports on the "Orissa rivers" from both the commissioner and collector, the latter gentleman also placing the *Teesta* at my disposal. Mr. Levinge, C.E., of the East India Transit and Canal Co., also placed his lithographic press at my service. This proved of great assistance to me.

After arranging everything in Cuttack, I proceeded down to False Point *via* "Taldunda," and on the 18th September commenced the operations of the survey by measuring two base lines on Dowdswell's Island and working from them, thus rendering my work totally independent of all former surveys.

The survey of False Point anchorage fully employed us till the end of October; very little if any change had taken place in the anchorage proper; in fact, from charts in my possession, it has been nearly the same for the last 15 or 20 years.

The channels from the anchorage to the light-house, Bacoed and Jumboo, were triangulated and surveyed for the first time.

False Point anchorage is formed by a long low sandy island called Dowdswell's, extending to about six miles north north-east of the light-house; the anchorage is inside the extreme north point of the island, and is well marked off by buoys and beacons as follows:—1st, Point Reddie beacon on the north end of the island, visible ten miles, and a most useful mark for making the port from sea; a wooden spire buoy in about 25-feet water, bearing north by west, distant three-quarters of a mile from Point Reddie, and shewing the entrance to the anchorage, marked and called the A buoy; the C buoy, small iron, marking the edge of the sand inside of Point, in 16 feet reduced; the B buoy, also iron, 700 yards north-west of the C, in 14 feet reduced, and marking the western limit of the anchorage for deep vessels; and the E buoy to the east and the D buoy to the west, marking the limit of anchorage for vessels of 12 to 13 feet draught.

A vessel making the port should give Point Reddie a berth of about half a mile, and then steer up midway between the buoys until in a proper depth for anchoring. Should the buoys be gone, she should keep False Point light-house midway between two small beacons on Plowden's Island; this is a fair mid-channel track; vessels drawing 18 to 20 feet should anchor near the B and C buoys, unless it is intended to discharge cargo, when they may with perfect safety stand up the anchorage until they ground, as the bottom is a very soft olive-coloured mud.

Plowden's Island is a small low one, covered with jungle, in the centre of the bay formed by Dowdswell's, and having extensive mud flats all round it.

From the anchorage to the Light-house, about six and a half miles, there is a small boat channel with one or two feet of water in it, passing close to the east side of Plowden's Island, nearly up to the plantation; above that it is for the most part dry at low-water. This channel is marked by bamboos on each side, kept in order by the superintendent, Light-house. A boat wishing to go up to the light-house, should leave the anchorage at first-quarter flood, and to return, should leave the Light-house immediately the tide falls.

It is high water at the Light-house one hour later than at the anchorage.

West by south from the anchorage lies the mouth of the Jumboo river, accessible on a flood-tide only, there being a bad bar between it and the anchorage, with only one or two feet of water on it at low tide.

From the anchorage a small channel runs to the south-west, passing a short distance to the west of Plowden's Island and called "Bacood channel." A bar of very soft mud and sand, dry at low water, lies off the south-west point of the island, after passing which there is a tortuous channel of four to six feet leading into Bacood creek. This is the present route used by the steamer running from the anchorage to the canal, and will, I believe, remain the principal means of communication with the interior, as it will afford ready access to both the Kendraparah and Taldunda canals. I would therefore strongly recommend that something be done to improve the bar by means of spurs, &c. I may add that 1,500 piles and 1,500 fascines are ready at the Kurruminassie rice ghatis for this purpose.

Bacood Creek.—With the exception of a bar of two feet near the entrance, this creek possesses a good channel throughout, to its junction with the river Mahanuddy, and calls for no special remarks.

The survey of Bacood creek was completed in the early part of December 1868, after which the work was much delayed by the non-arrival of the steamer *Gemini*. As the *Teesta* could not be taken any distance from her regular work, the interval, or up to 12th January 1869, was employed by me in making a tour through the Pattakoond river, Paradeep creeks, Jumboo, Boronee, &c., and ascertaining what was worth the expense of a survey. On the 12th the *Gemini* arrived from Calcutta, and the survey of the Jumboo was immediately proceeded with.

The Jumboo river, from the anchorage to Deolparrah, was closely surveyed in eight sheets, and was found navigable for an inland steamer up to the latter point, but with several very sharp turns, which would make it difficult for a vessel to navigate in strong floods, and this, with the bad state of the Jumboo or canal creek (between Deolparrah and the tidal locks of the canal at Marsaghye), and it being two and a half miles longer than the Bacood creek and Noona route, led to the preference being given to the latter.

The Jumboo or canal creek was surveyed in four sheets and was found almost useless, there being several bars dry at low-water. This route was therefore abandoned, the surveys being completed early in May 1869.

I then proceeded to Calcutta and got down a fresh supply of stores, &c., returning to False Point on the 22nd May, and commenced the survey of the "Noona route."

The Noona route to the Kendraparah canal.—A good navigable channel for inland steamers was found throughout, from the junction of the Bacood creek with the Mahanuddy to Kurmkool, about one and a half miles below the canal. From Kurmkool to the canal was found to be bad, full of shifting sands, and with a bar of only two to three feet reduced.

Great changes have taken place in this portion of the river since the survey was completed; the high dry sand shewn off Marsaghye has gone down on to the point, blocking up the small channel there, and a great portion of the Noona freshet is thus forced down the canal creek to the Jumboo. I found on my last trip there that this had had a bad effect on the "Noona channels" for some miles down, and I would suggest something be done to prevent it in future.

The tidal locks of the Kendraparah canal are very unfortunately placed: a boat drawing four feet has to wait for high water to get into them owing to the shoals about here.

The survey of the Noona route was completed by the 31st July; the *Gemini* was then beached, scraped, and painted, all boats were overhauled, screw pile beacons put up to mark the various channels from False Point anchorage, and on the 17th August was commenced the survey of the river Mahanuddy from sea to the Kenreddia or Taldunda anchorage.

The Mahanuddy.—If it was not for the bar and heavy surf at the mouth, this would be one of the finest rivers on this coast. A good channel, with two fathoms at low water in the shoalest part; extends from the junction with the "Noona" to close alongside the surf on the bar. If this bar could be removed a vessel of 500 tons burden could get 15 miles into the interior. Above the "Noona" the Mahanuddy has a good channel for an inland steamer up as far as Kenreddia creek, or junction with the Pilia river. Above this the river rapidly becomes shoal, and useless for the purposes of navigation.

The Taldunda canal (now in course of construction) will, I believe, join the Mahanuddy somewhere near the village of Bhootmoondie. When this canal is completed this will be the best and quickest mode of communication with Cuttack from False Point anchorage, and will draw all except a small local trade from the Kendraparah route. The crossing of the

Mahanuddy above the Jobra anicut (which is dangerous in heavy freshets) will also be avoided.

After careful consideration of all the advantages and disadvantages of the different routes to and from Cuttack *via* False Point, I have come to the conclusion that it would be waste of money to spend anything on the "Jumboo," and the principal and first thing to be done is to improve the Bacoed bar, so that the *Teesta* could run in and out at any time of the tide. This I should think could easily be done, and I much regret that, owing to circumstances beyond my control, I had no opportunity of trying the effect of one or two good spurs, materials for which, as I before stated, have been collected at Kurrumassie. The improvement of this bar I consider of vital importance to the well-being of False Point as a port, and no other work of improvement, such as building golahs, &c., should be undertaken until this experiment has been tried. If it succeeds, the *Teesta* could run from the Taldunda canal to the anchorage and *vice versa* in two and a half hours, and in cases of emergency make three or more trips in the day.

The small tidal creeks along the coast.—There is water communication between the Jumboo and Bacoed through a small creek called "Ramchundra Gullia," which runs out of Bacoed creek a little above the old rice golahs, and joins the "Jumboo" about one mile from its mouth; it is very narrow and tortuous and can only be used by boats.

A creek also runs along the coast from the Jumboo to the Boronee, and from thence by a very winding course to Hunsah on the Brahmunnec river. This is also very narrow, and can only be used by boats.

Water communication inland also exists between the Mahanuddy and Davy rivers, leaving the former *via* Paradeep creek, passing Cojung and Hurrichpoor, and joining the Davy near the village of "Nogoro." This route is however of very little use, as my boats drawing two feet had to wait for spring-tides to pass a bad shoal near Hurrichpoor.

Small rivers on the coast of Orissa are: 1st.—The Boronee, a small stream running into False Bay to the north-west of "Point Reddie." A boat blown out of the anchorage might find shelter inside this river.

2nd.—The Pattakoond river, the old sea entrance to which is closed, and the water from it discharged by the Mahanuddy mouth.

The Jotadur, with a bar nearly dry at the mouth, and the "Katoo," with a dry bar also. This river was reported on by Mr. Macmillan, C.M., who said it appeared to have a good sea entrance. He could have only seen it during a heavy freshet, as in January it was dry across the mouth, and the natives round Hurrichpoor say that they can nearly always wade across it.

Lastly, the Moogrand and Godakond, small streams not worthy of note.

The surveys and explorations in the vicinity of False Point anchorage were all completed by the end of September 1869. During October I was employed going round with the commissioner, collector, &c., in order to determine on the best means of opening out a trade at False Point, &c., putting up marks that had been blown down, erecting screw beacons, &c. At the end of the month I proceeded to Calcutta on leave. Returning to False Point on the 15th November, went into Cuttack to arrange for survey of the Davy river. Back to False Point on the 26th, caulked and painted vessel, and on the 1st December left for Point Palmiras shoals. Erected Shortt's tripod beacon there, completed this by the 6th, returned to False Point, repaired boiler which had given way, and on the 10th left for the Davy river, running down along the coast in the steamer, and sending out boats *via* the creeks.

Davy river.—The survey of this river commenced on the 12th December 1869. Great changes had taken place in it since the former survey in 1860, especially off the upper end of Tandah creek. This river was completed (in three sheets) by the end of January 1870. A permanent beacon was erected at the mouth in latitude 19°, 58', 0" north; only four feet reduced was found on the entrance bar, with a nasty swell breaking into surf at times on the ebb-tide. After passing this bar a fair channel was found up to the village of Nogoro, where the Machgong canal will join the Davy. Above this the river rapidly becomes shoal, and off Machgong people wade across at low-tide. This river is of little use, as there is only a 6-foot range of tide on the springs, and even native craft prefer to load by means of musallah boats through the surf at Tandah to entering the river.

On completion of the Davy survey we sent out boats to the Dumrah through the creeks, returning up the coast with the steamer to False Point.

After arranging with the Collector, Cuttack, for postal communication, &c., we filled up coal at the hulk and proceeded to Dumrah, commencing the survey of that river on the 10th February 1870.

The Dumrah river, by far the best of any on the coast of Orissa, lies close to the northward of the point Palmiras shoals. The entrance is marked by the Kannaka buoy in 21 feet reduced and Shortt's tripod beacon on the extreme north-east dry portion of point Palmiras Reef. The entrance to this river has much improved since last surveyed in 1860; the old outer bar of nine feet still remains, but a second channel has opened out about a mile to the south of it, with not less than ten feet on it. From this to the inner bar remains the same. The inner bar has much improved, there being not eight feet on it. This part appears liable to great changes. In 1859 there were 12 feet on this bar, in 1866 only three feet, and now, 1870, there are again eight feet. From Chandepaul there is a fair navigable channel with no serious obstruction up to the mouth of the "Byturnee." Above the Byturnee the river changes its name from

Dumrah to "Brahmunnee river," and has a fair channel without obstruction to off "Mow." Between "Mow" and "Dusseepore" there is a bad reach, with bars of only two and three feet reduced, and from Dusseepore to Albha a middling channel with four feet. In places above Albha the river rapidly becomes unnavigable.

The intention at present I believe is to bring the Pattamoondie canal into the Brahmunnee at Albha. I am afraid that this will only prove a source of trouble hereafter, and that it would be advisable to carry it down past the bad shoals between "Dusseepore" and "Mow," and enter the river near "Rajpore." A vessel drawing ten feet could then always get to the canal from sea without difficulty, and a vessel drawing 14 or 15 feet could reach it by taking the proper time of tide.

Branches or tributaries of the Dumrah and Brahmunnee rivers.—A little above the Custom House the Mutie strikes off to the northward. This river is navigable for native sloops to south Balliapol, and for boats to near Rbokanaidapoor. About six miles above the "Mutie" is the Byturnee, running to the westward, and navigable to Chandbally, a fine river with well-defined channels.

Near Hunsooh the Mypurra river runs to the east and empties itself into the sea close under point Palmiras; useless for navigation, it being shoal at both entrances. A few miles above this the Kursoca river runs off to the west north-west, navigable up to the town of Aul, a place of some small trade.

It will be seen from the above that the Dumrah river is therefore the best on the coast and has communication with a larger extent of country than any of the others through its numerous tributaries, &c.

Above "Mow" the water is perfectly fresh at all times, and might be used advantageously for irrigation purposes. A cheap windmill pump would be much appreciated by the natives here, instead of their slow method of taking up water.

From the above report you will see that about 150 miles of rivers have been surveyed, mostly through dense jungle, and with no former triangulation or data to rely on, necessitating constant care to prevent errors creeping in. Charts of the above have been sent in, and about 800 miles more of rivers and creeks have been examined. Numerous useful marks and beacons have been erected, and most valuable information acquired about the water communication in Orissa,—information that would have been invaluable in the famine of 1866. Proper sites have also been pointed out for the junctions of the great canal scheme with tidal water, by which the errors of the Kendraparrah canal will be avoided. Some knowledge of the tides on the coast obtained by registers (see tables), and the whole has been completed in 20 months, and at an expense of not more than from Rs 1,600 to 1,700 per mensem. I trust therefore that my work in Orissa may meet with the approbation of the Government I serve. I would beg to bring to your notice the excellent conduct of Mr. J. H. Nickles, assistant on survey, who did his work cheerfully and well in all weathers, and of Mr. D. L. Barr, who deserves great credit for the way he kept the *Gemini* running till the work was finished, with a sadly defective boiler.

To shew that the work was well done, I may add that after triangulating with sextant only for nearly 40 miles up the Brahmunnee and partly through dense jungle, the difference between the measured and calculated base was only five yards, and in the Jumboo after ten miles through jungle was only 14 inches.

Could time have been allowed me, a map of all the rivers surveyed, on a scale of one mile to the inch, could have been compiled, with a short memorandum of directions for navigating each. This would have been very useful, and would, I think, almost pay for the expense of publishing it by the sale of copies, as I have had many applications for something of the sort. If it had to be done, it would however be necessary for me to superintend it, as our marine survey books would not be understood except by one accustomed to that work.

List of charts published.

False Point anchorage	... 1 sheet.	Canal creek	... 4 sheets.
Bacood creek	... 3 sheets.	Mahanuddy	... 5 "
Noona route to canal	... 6 "	Davy river	... 3 "
Jumboo river	... 8 "	Dumrah	... 2 "

and the Brahmunnee 5 sheets, or a total of (37) thirty-seven charts in all.

List of rivers and creeks examined.

Ramchundra Gullia.
Bamcha nulla.
Boicha nulla.
Hunsooh nulla.
Paradcep creeks.
Lamagole creek.
Moogrand river.
Godakond river.
Cojung creeks.
Jotadur river.
Mypurra river.

Mutie river.
Byturnee river.
Kursoca river.
Brahmunnee river, upper.
Chota Brahmunnee.
Ngona river, upper part.
Pattakoond river.
Mahanuddee river, upper.
Katoe river mouth.
Boronee river.
Bansghur river.

and several others too small to prove of any service.

Tidal Registers.—Tide registers at Davy, False Point and Dumrah are appended, as they may be interesting to those studying the tidal wave. The range at the Davy is six feet, at False Point eight feet, at the Dumrah ten feet, and at Balasore thirteen feet; on spring tides the range steadily increasing as you get to the northward.

I will now draw this report to a close; with a request that the Commissioner of Cuttack be supplied with a copy of it, and trusting it will meet with your approbation.

Tidal Register.—Plowden's Island, False Point, 1869.

Dates.	Time.	H. W.	Time.	L. W.	Range.	Mean level.	Day	REMARKS.
		Ft. Ins.		Ft. Ins.	Ft. Ins.	Ft. Ins.		
1st January	...	7 6	...	1 6	6 0	4 5	...	Ordinary N. E. monsoon weather.
2nd	...	7 2	...	1 6	5 8	4 4	...	Ditto
3rd	...	6 11	...	1 8	5 8	4 3½	...	Ditto
4th	...	6 11	...	1 11	4 0	4 3½	...	Ditto
5th	...	6 4	...	2 2	4 2	4 8	...	Ditto
6th	...	6 6	...	2 6	4 0	4 6	...	Ditto
7th	...	6 8	...	2 9	3 11	4 8½	...	Ditto
8th	...	6 10	...	2 7	4 3	4 8½	...	Ditto
9th	...	6 11	...	2 6	4 4	4 8½	...	Ditto
10th	...	7 0	...	2 4	4 8	4 8	...	Ditto
11th	...	7 0	...	2 0	5 0	4 6	...	Ditto
12th	...	7 1	...	1 9	5 4	4 5	...	Ditto
13th	A.M. 8-15	7 2	P.M. 3-15	1 6	5 6	4 4	Full	Ditto
14th	...	7 3	...	1 11	5 10	4 4	...	Ditto
15th	...	7 1	...	1 8	5 5	4 4½	...	Ditto
16th	...	7 0	...	1 11	5 1	4 5½	...	Ditto
17th	...	6 11	...	2 1	4 12	4 6	...	Ditto
18th	...	6 9	...	2 3	4 0	4 6	...	Ditto
19th	...	6 6	...	2 5	4 1	4 5½	...	Ditto
20th	...	6 3	...	2 6	3 8	4 5½	...	Ditto
21st	...	6 1	...	2 8	3 5	4 4½	...	Ditto
22nd	...	6 0	...	2 10	3 2	4 5	...	Ditto
23rd	...	6 1	...	2 11	3 2	4 6	...	Ditto
24th	...	6 2	...	2 9	3 5	4 5½	...	Ditto
25th	...	6 3	...	2 6	3 10	4 4	...	Ditto
26th	...	6 5	...	1 10	4 7	4 1½	...	Ditto
					Mean ...	4 5		

This gauge was the basis of all the reductions to low-water of the Orissa survey.
N. B.—The zero of this gauge is 16 feet 3 inches below sill of well on Dowdswell's Island.
Gauge still standing on N. E. point of island.

Tidal Register.—Plowden's Island Gauge.

Dates.	H. W.	L. W.	Range.	Mean level.	Day	REMARKS.
	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.		
Sept. 25th, 1869	6 2	5 4	0 10	5 9	...	Least range of tide ever observed here.
Nov. 14th	6 8	2 9	6 11	6 2½	...	Highest rise observed here. Wind fresh.
Aug. 9th, 1869	9 5	1 6	7 11	5 5½	...	Greatest observed range at False Point.
Aug. 10th	9 5	1 6	7 11	5 5½	...	
Dec. 30th, 1869	7 8	1 2	6 6	4 6	...	Tide fell to the lowest observed level.

The above shows a few of the peculiarities of the tides in the vicinity of False Point.

Tidal Register.—Off Bacood village, 1869.

Dates.	Time.	H. W.	Time.	L. W.	Range.	Mean level.	Day	REMARKS.
		Ft. Ins.		Ft. Ins.	Ft. Ins.			
21st August	...	7 6	...	3 7	5 11	...	...	Ordinary weather.
22nd	A.M. 10-15	7 8	...	3 7	4 1	...	Full	Ditto
23rd	...	7 7	...	3 3	4 4	...	...	Ditto
24th	...	7 5	...	3 0	4 7	...	...	Ditto
25th	...	7 5	...	2 10	4 7	...	...	Ditto
26th	...	7 5	...	3 2	4 3	...	...	Ditto
27th	...	7 7	...	3 10	3 9	...	...	Ditto
28th	P.M. 9-0	7 9	...	5 11	1 10	...	...	Strong fresh running down.
29th	...	7 10	A.M. 9-0	6 9	1 1	...	...	Ditto
30th	...	8 2	...	7 6	0 8	...	...	Ditto
31st	...	8 8	...	8 1	0 3	...	...	Ditto
1st September	...	8 3	...	7 11	0 4	...	...	Ditto
2nd	...	8 3	...	7 10	0 5	...	...	Ditto
3rd	...	8 10	...	8 0	0 10	...	...	Ditto
4th	...	9 1	...	8 0	1 1	...	...	Ditto
5th	...	9 1	...	7 8	1 5	...	...	Ditto
6th	...	8 9	...	6 6	2 3	...	New	Fresh taking off.
7th	...	8 6	...	5 7	3 11	...	...	Ditto
8th	...	8 4	...	5 1	3 8	...	...	Ditto
9th	...	8 3	...	5 0	3 3	...	...	Ditto
10th	...	7 10	...	4 1	2 9	...	...	Ditto
11th	...	7 4	...	4 11	2 6	...	...	Ditto

This table shows influence of fresh on the tides.

Tidal Register.—Jumboo Godown Gauge, 1869.

Dates.	H. W. Time.	H. W. Day.	L. W. Day.	H. W. Night.	L. W. Night.	Range. Day.	Range. Night.	Difference.	REMARKS.
		Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	Ft. Ins.	
11th January	...	6 5	1 10	7 5	2 0	4 8	5 6	0 10	
12th "	...	6 8	1 17	7 4	1 11	4 11	5 9	0 10	
13th "	A.M. 5-45	6 8	1 6	7 10	1 10	5 9	6 0	0 10	Full Moon.

This shows that, to obtain a correct knowledge of the tides, observations should be recorded day and night.

Tidal Register.—Davy River, 1870.

Dates.	Time.	H. W.	Time.	L. W.	Range.	Mean level.	D	REMARKS.
		Ft. Ins.		Ft. Ins.	Ft. Ins.	Ft. Ins.		
1st January	A.M. 9-30	6 8	P.M. 3-45	2 1	4 7	4 4½	...	Ordinary N. E. monsoon.
2nd "	10-00	6 8	4-15	2 2	4 6	4 5	New	Ditto
3rd "	10-30	6 8	4-45	2 4	4 4	4 5	...	Ditto
4th "	11-32	6 9	5-30	2 5	4 2	4 7	...	Ditto
5th "	A.M. 11-45	6 7	6-00	2 7	4 0	4 7	...	Ditto
6th "	P.M. 0-45	6 4	6-37	2 10	3 6	4 7	...	Ditto
7th "	1-00	6 1	7-15	2 10	3 8	4 6½	...	Ditto
8th "	1-15	6 1	8-00	3 0	3 1	4 6½	...	Ditto
9th "	2-30	5 10	8-45	3 1	2 9	4 5½	...	Ditto
10th "	3-15	5 9	9-30	3 3	2 11	4 5½	1st qr.	Ditto
11th "	4-00	5 4	10-15	3 4	2 4	4 5	...	Ditto
12th "	6-15	6 2	10-45	3 6	2 8	4 10	...	Fresh N. E. wind.
13th "	5-45	6 6	Noon.	3 6	2 11	4 11½	...	Ditto
14th "	A.M. 6-45	6 1	P.M. 1-15	3 2	2 11	4 7½	...	Ordinary weather.
15th "	7-45	6 3	2-0	3 0	3 8	4 7½	...	Ditto
16th "	8-30	6 9	3-30	2 11	3 10	4 10	...	Ditto
17th "	9-15	7 2	4-00	2 8	4 6	4 11	Full	Total eclipse of ☾
18th "	9-45	7 3	4-30	2 6	4 9	5 10½	...	Fresh breeze.
19th "	10-30	7 4	5-00	2 6	4 10	4 11	...	Ditto
20th "	11-30	7 11	5-30	2 10	4 8	5 2	...	Ditto
21st "	Noon	7 4	6-45	2 11	4 5	5 1½	...	Ditto
					Mean ...	4 8		

This gauge was a little below Negro.

N. B.—The zero of this gauge was 12 feet 8 inches below D. P. W., B. M., P. F., No. 80.
Gauge removed.

Tidal Register.—Demrah Gauge, 1870.

Dates.	Time.	H. W.	Time.	L. W.	Range.	Mean level.	D	REMARKS.
		Ft. Ins.		Ft. Ins.	Ft. Ins.	Ft. Ins.		
16th February	A.M. 10-15	10 2	P.M. 5-30	1 6	8 8	5 10	Full	
17th "	11-10	10 6	A.M. 6-00	1 4	9 3	5 11	...	Ordinary N. E. monsoon.
18th "	Noon	10 2	6-45	1 3	8 11	5 8½	...	Ditto.
19th "	P.M. 0-30	10 0	7-35	1 2	8 10	5 7	...	Ditto
20th "	1-30	10 0	8-15	1 6	8 6	5 9	...	Ditto
21st "	2-30	9 4	9-0	1 7	7 9	5 5½	...	Ditto
22nd "	3-0	8 8	9-30	2 4	6 4	5 6	...	Ditto
23rd "	3-30	8 5	10-15	2 6	5 6	5 8	Last qr.	Ditto
24th "	4-0	7 2	10-45	3 0	4 2	5 1	...	Ditto
25th "	5-0	6 10	11-15	3 2	3 8	5 0	...	Ditto
26th "	A.M. 7-30	7 2	P.M. 1-0	2 10	4 4	5 0	...	Ditto
27th "	8-30	7 9	2-0	2 5	5 4	5 1	...	Ditto
28th "	9-30	8 3	3-30	2 4	5 11	5 2½	...	Ditto
1st March	10-00	8 2	4-30	1 10	7 4	5 6	...	Ditto
2nd "	10-50	8 7	5-30	2 0	7 7	5 8½	New	Ditto

C. A. HARRIS,
Orissa Survey.

Office note by COLONEL F. H. RUNDALL, R.E., Chief Engineer, Bengal, Irrigation Branch, on the Report of the Orissa Coast and Tidal River Survey by C. A. HARRIS, Esq.

On reading this report, I find a few points on which Mr. Harris has expressed an opinion different from what I have in other places recorded, and I therefore think it necessary to offer the following remarks.

2. I was told when last at False Point that a very decided change had taken place in the extension of Point Reddie, and in the formation of what was termed a second boat-bay. This change has, I believe, occurred since Mr. Harris' survey has commenced. This is quite in accordance with the changes that take place in similar localities: Point Godavery, which is precisely similarly situated, having extended 9 miles to the north in 30 years.

3. It is important to notice that with the extension of that Point, the anchorage itself, owing to the silting up of Coconada Bay, has moved also to the north; and unless measures are taken to prevent it, the same process will undoubtedly take place in the shifting of the anchorage at False Point. It is important that this fact is not lost sight of, as it has an essential bearing on the routes for boats from the interior and the ultimate permanent location of the sea-port town.

4. *Bakood Creek.*—This will form one of the routes into the interior, but I do not feel at all sure that it will "remain the principal means of communication,"—certainly not with the Kendrapara Canal, although it may do so with the Taldundah Canal,—for this reason that being a broad, open, and deep river, the ordinary boats of the country cannot venture on it during very high winds, and cannot make head against the strong current of the freshets between the months of June and October. Moreover there is no tow-path, and it would be difficult to make one which would be effective at all times.

5. For this reason the Jumboo River route is now actually used in preference by the country craft. There is plenty of water for these boats from the canal to the anchorage at high tide, and during the freshets, of course, there is no want of water at any part of the 24 hours. The land is all cultivated to within 4 miles of the mouth, and therefore a tracking path is ready to hand, and boats can be easily towed back against the current. Moreover, being narrow and sheltered, it is quite safe for country boats. Mr. Harris' remarks are apparently made with reference to the navigable facilities of the two routes for steamers. The very reason, why Mr. Harris depreciates the Jumboo River route are those which make it valuable for boat traffic. He is evidently unaware that as soon as the trade to the port begins to be large, the means of conveyance must be by the ordinary boats of the country. The steamer which plies now (the *Teesta*) is for the purpose of assisting the traffic until it becomes firmly established, after which either private parties will start their own steamers and fit them for the routes along which they will play, or else the trade will be carried on without the aid of steam.

6. Mr. Harris next observes—"The Jumboo or Canal Creek was surveyed in four sheets and was found almost useless, there being several bars dry at low water. This route was therefore abandoned." I presume Mr. Harris means "abandoned" by himself as a route for steamers; for as said above, it is the route which is now pursued by the great proportion of the country boats.

7. With reference to Mr. Harris' observations that "the tidal locks of the Kendraparah Canal are very unfortunately placed, a boat drawing 4 feet has to wait for high water to get into them, owing to the shoals about here," I would point out that, in the first place, as boats only navigate tidal water with the tide, they almost invariably reach the canal terminus at the top of high water or on the rising tide, and therefore the time of detention is reduced to a minimum; besides which, the terminus of the canal under any circumstances becomes a halting place, for boats will always wait for the tide. There was no use therefore in taking the canal beyond the limit which boats could reach by the tide, and when the terminus was fixed upon and the locks commenced, there were no shoals which impeded navigation; these shoals can be remedied by groins, and may possibly in the freshets disappear.

8. Again, Mr. Harris is wrong in supposing that "the Taldundah Canal will draw all except a small local trade from the Kendraparah route."

9. The Taldundah Canal will take all that comes to Cuttack from the south, but the traffic from the north and much from the Gurjats via both the Mahanuddy and the Brahmines and Byturnes will take the Kendraparah Canal. Already some of the Gurjat trade goes straight to the canal without touching at Cuttack.

10. Hence Mr. Harris' "conclusion that it would be waste of money to spend anything on the Jumboo" is quite a wrong one. The bar at the Jumboo is just as easily improvable as the Bakood Bar, and both should be carried out simultaneously, for neither will be expensive.

11. Similarly, his recommendations "that no other work of improvement, such as building golihs, &c., should be undertaken until this experiment has been tried" is entirely a mistake for the simple reason that the bar is practicable even now for the *Teesta* itself at three-quarter tide, and hence there is nothing to affect the interests of the port, whether the experiment of improving it is successful or not, any more than there is to affect Calcutta, because ships have to wait for the rise of tide over the various bars of the Hooghly. The point of greatest immediate importance is the creation of some facilities in the way of storing goods and shipping and landing cargo, together with a suitable port establishment. The removal of the bars is a very desirable work in itself, but is nevertheless more of an *improvement* than an absolute necessity at the outset of operations.

12. Though all the inferences which Mr. Harris has drawn from his recent labours are such as I cannot subscribe to, yet the surveys which he has so ably completed are exceedingly valuable, and I am sure he has well earned the commendation of the Government.

Report on the state of the Salt Market for the Fourth Quarter of 1869-70.

From F. B. PEACOCK, Esq., Officiating Junior Secretary to the Board of Revenue, Lower Provinces, to the Officiating Secretary to the Government of Bengal, Revenue Department,—(No. 304C, dated Fort William, the 7th June 1870.)

I AM directed by the Board of Revenue to submit the following report on the state of the salt market for the fourth quarter of 1869-70, comprising the months of January, February, and March last:

2. The quantity of Government salt sold at the Presidency under wholesale rowanahs amounted to maunds 5,835, as shewn on the margin, giving a monthly average of maunds 1,945, against maunds 1,628 in the preceding quarter. The sales which, as in the previous five quarters, were confined to the Hidgelee stocks, shew a slight increase over those in the preceding quarter.

3. The sales of Government salt at Pooree amounted to maunds 7,039, against maunds 31,363 in the preceding quarter, and maunds 43,755 in the corresponding quarter of 1868-69. The large decrease in the sales during the quarter under review, as compared with those of the previous quarter, is attributable, as stated in the last quarterly report, to the entire exhaustion of the stocks of Kurkutch at the several anrungs,—the Pungah salt, which is the more expensive of the two, not being in great demand, and supplies of the former being available in the markets.

4. The quantities of excise salt sold in Cuttack, Balasore, and the 24-Pergunnahs, from the stocks manufactured in 1867-68 and 1868-69, and the quantities which remained in store at the close of the quarter, are shewn in the following statement:—

	CUTTACK.			BALASORE.				24-PERGUNNAHS.	
	MANUFACTURE OF			MANUFACTURE OF				MANUFACTURE OF	
	1867-68.	1868-69.	1869-70.	1867-68.	1868-69.	1869-70.	1869-70.	1868-69.	1869-70.
	Mds. Srs.	Mds. Srs.	Mds. Srs.	Mds. Srs.	Mds. Srs.	Mds. Srs.	Mds. Srs.	Mds. Srs.	Mds. Srs.
Balance at close of last quarter	149 10	1,610 87	...	44 30	10,311 27½	48,679 14	...	460 0	257 5
Manufactured during the quarter	...	...	23,293 20	...	...	...	1,08,788 30	...	14,885 20
Total	149 10	1,610 87	23,293 20	44 30	10,311 27½	48,679 14	1,08,788 30	460 0	15,142 25
DEDUCT—									
Quantity sold during the quarter	...	1,312 22	...	44 30	5,323 35	19,855 0	...	266 0	...
Deficiency or wastage	...	...	...	...	598 32½	...	...	181 0	...
Total	...	1,312 22	...	44 30	5,871 27½	19,855 0	...	450 0	...
Balance at close of quarter	149 10	298 15	23,293 20	...	10,440 0	28,824 14	1,08,788 30	...	15,142 25

It will be seen from the above that the total clearances of excise salt during the quarter amounted to maunds 26,814, against maunds 40,173 in the previous quarter, and maunds 28,382 in the corresponding quarter of 1868-69. The decrease in the sales during the quarter under report, as compared with the sales in the previous quarter, amounts to maunds 13,359, and is confined to the districts of Cuttack and 24-Pergunnahs. The Collector of Cuttack has explained that the decrease in the sales is owing to the stock of excise salt in the district being exhausted, present supplies being received from Ganjam. Similarly, in the 24-Pergunnahs, there was no excise salt available for sale, the manufactures of 1869-70 being still in anrungs.

5. The subjoined statement shews, comparatively, the total importations into the port of Calcutta, and the total clearances of sea-imported salt during the quarter and the corresponding quarter of the two preceding years:—

Description of Salt.	3 RD QUARTER OF 1867-68.		4 TH QUARTER OF 1868-69.		4 TH QUARTER OF 1869-70.	
	Imported.	Cleared.	Imported.	Cleared.	Imported.	Cleared.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Liverpool Pungah ...	17,59,360	13,03,453	19,06,400	11,97,954	21,40,752	14,51,480
Foreign Kurkutch ...	61,547	2,00,583	61,410	83,910	97,522	88,876
Indian Kurkutch ...	1,12,713	1,02,865	3,19,175	1,93,562	3,23,711	2,07,842
Ceylon ...	45	3,116	...	2,000	...	9,418
Total ...	19,16,674	17,10,047	23,00,985	14,76,526	25,07,985	17,54,126

6. The following are the details of the Indian Kurkutch salt shown above:—

Whence imported.	4 TH QUARTER OF 1867-68.		4 TH QUARTER OF 1868-69.		4 TH QUARTER OF 1869-70.	
	Imported.	Cleared.	Imported.	Cleared.	Imported.	Cleared.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Kurkutch ...	...	...	45,180	...	1,02,084	4,850
Bombay ...	1,12,713	1,02,865	1,88,506	1,28,466	1,61,088	1,44,400
Madras ...	...	...	28,200	65,086	16,110	53,248
Ennore ...	...	...	...	...	...	4,150
Cavelong ...	...	...	57,220	...	...	...
Tuticorin ...	...	...	...	...	43,799	434
Total ...	1,12,713	1,02,865	3,19,175	1,93,562	3,23,711	2,07,842

7. The following table shews the total quantity of sea-imported salt remaining in bond at the close of the quarter, as compared with the previous quarter of the year:—

Where stored.	1 ST quarter of 1869-70.	2 ND quarter of 1869-70.	3 RD quarter of 1869-70.	4 TH quarter of 1869-70.
	Mds.	Mds.	Mds.	Mds.
Calcutta and Sulkea ...	22,03,611	22,98,667	21,57,945	23,61,014
Chittagong ...	2,14,233	1,55,562	1,35,498	3,55,444
Total ...	24,17,844	24,54,229	22,93,443	27,16,458

The large increase of storage in the Government godowns at Sulkea is very satisfactory.

8. The following statement exhibits the despatches of salt from Calcutta by water, and the three Railways *via* the several pass stations into the interior of the country both east and west of the river Hooghly, during the quarter under review and the corresponding quarter of the two preceding years:—

Period.	<i>Via</i> Balakhal.	<i>Via</i> Sankrail.	<i>Via</i> Gera-khalco.	<i>Via</i> Kidder-pore.	<i>Via</i> Ballia-ghatta.	By the East Indian Railway.	By the Eastern Bengal Railway.	By the Calcutta and S. E. Railway.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Fourth quarter of 1867-68 ...	4,79,287	90,183	39,680	89,155	10,72,060	2,11,728	2,814	12
Do 1868-69 ...	3,52,690	1,15,035	97,710	80,697	9,41,341	2,39,017	5,286	43
Do 1869-70 ...	3,57,472	1,50,421	1,15,511	70,142	10,32,583	2,10,068	9,666	21

The quantity of salt despatched by the East Indian Railway to stations beyond Buxar amounted to maunds 6,426.30, against maunds 4,202.20 in the preceding quarter, and maunds 1,301.30 in the corresponding quarter of the previous year.

9. The shipments of Liverpool salt for the ports of Calcutta and Chittagong, according to published market reports, were as follows :—

Month.	Calcutta.	Chittagong.
	Tons.	Tons.
January 1870 ...	10,559	.....
February ..	2,187	.....
March ..	14,758	.....
Total ...	27,432	.....

10. The prevailing market prices per hundred maunds of Liverpool and other descriptions of salt at the close of each fortnight during the quarter under report, as compared with those which obtained at the same periods of last year, are shown in the following statement :—

Description of Salt.	Prices on 15th January		Prices on 31st January		Prices on 14th February		Prices on 28th February		Prices on 15th March		Prices on 31st March	
	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.	1869.	1870.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Liverpool Pungah ...	81	00	77	02	78	03	79	04	80	04	77	02
French Kurkutch ...	90	70	85	70	79	70	00	00	82	60	80	05
Jeddah ditto ...	98	85	05	85	95	85	05	85	95	85	05	85
Ceylon ditto ...	72	50	71	50	71	58	70	59	70	52	08	52
Scinde ditto ...	95	80	35	00	02	50	05	50	65	50	65	50
Bombay ditto ...	07	42	05	42	02	30	55	43	50	37	65	83
Madras ditto ...	70	50	70	55	68	54	00	51	70	54	65	59

11. The following statement exhibits the total quantities of salt that were available for the private export-trade at the several depôts in the Madras Presidency on the first day of each of the three months constituting the present quarter, and the corresponding quarter of 1867-68 and 1868-69 :—

Month.	1867-68.	1868-69.	1869-70.
	Mds.	Mds.	Mds.
January ...	12,41,780	9,42,588	7,13,160
February ...	12,46,724	8,95,607	8,13,160
March ...	11,01,021	8,04,210	7,83,160

12. The following statement shows the quantities of sea-imported salt admitted into bond, and cleared from bond and ship-board at Chittagong during the quarter under review, and the corresponding quarter of 1868-69. No transactions in sea-imported salt have been reported during the quarter from Balasore, Pooree, and Cuttack :—

Description of Salt.	ADMITTED INTO BOND.		CLEARANCES.	
	Fourth quarter of 1868-69.	Fourth quarter of 1869-70.	Fourth quarter of 1868-69.	Fourth quarter of 1869-70.
Liverpool Pungah ...	82,651	2,60,508	65,868	67,629
Madras Kurkutch ...	5,842	.....	5,075	6,025
Total ...	88,493	2,60,508	71,943	73,654

Weekly Return of Traffic Receipts on Indian Railways.

EAST INDIAN RAILWAY MAIN LINE.

Approximate Return of Traffic for Week ended 29th May 1870 on 1,131½ miles open.

	COACHING TRAFFIC.				MERCHANDISE AND MINERAL TRAFFIC.				Total Traffic Receipts.									
	Number of Passengers.	Coaching Receipts.			Weight carried.	Receipts.												
		Rs.	As.	P.	Mds. Strs.	Rs.	As.	P.	£. s. d.									
Total Traffic for the week ...	98,401	1,15,273	11	11	10,508	12	2	8,13,470	0	5,70,516	0	5	43,056	12	9	51,222	7	11
Or per mile of Railway		101	14	1	0	0	0	43	12	0			38	17	0	48	3	3
For previous 20 weeks of half-year	22,47,378	28,07,032	1	10	3,49,977	18	11	1,47,75,808	20	82,44,081	1	3	7,04,056	11	13	11,15,934	10	10
Total for 21 weeks	23,55,779	29,22,105	13	0	3,50,544	14	1	1,53,99,308	20	84,24,497	1	8	8,08,013	4	8	11,09,456	18	10
COMPARISON.																		
Total for corresponding week of previous year	88,408	1,07,403	2	10	7,851	6	0	6,08,722	10	3,70,291	3	10	34,764	12	8	44,610	17	8
Per mile of Railway corresponding week of previous year		94	0	4	8	14	2			32	5	0	30	14	16	39	0	0
Total to corresponding date of previous year	20,04,841	22,71,089	3	41	2,69,004	17	0	1,08,07,023	10	50,21,674	10	1	6,27,006	7	8	11,24,010	0	3

* Rs. 11,510-10 added on account of freight of locomotive coal carried on Jubbulpore line.

EAST INDIAN RAILWAY JUBBULPORE LINE.

Approximate Return of Traffic for Week ended 29th May 1870 on 223 miles open.

		Rs.	As.	P.	Mds. Strs.	Rs.	As.	P.	£. s. d.
Total Traffic for the week ...	3,594	19,291	15	3	40,783	0	12,072	15	3
Or per mile of Railway		40	2	8	0	0	54	13	0
For previous 20 weeks of half-year	98,004	3,27,970	15	0	20,005	13	8	70,031	0
Total for 21 weeks	1,01,615	3,33,263	14	0	30,239	7	7	9,16,414	0
COMPARISON.									
Total for corresponding week of previous year	2,854	6,821	0	1	34,520	20	9,138	0	11
Per mile of Railway corresponding week of previous year		30	0	0	0	0	40	15	0
Total to corresponding date of previous year	70,761	2,10,008	10	11	18,333	8	2	2,77,230	7

EASTERN BENGAL RAILWAY.

Approximate Return of Traffic for Week ended 28th May 1870 on 113½ miles open.

		Rs.	As.	P.	Mds. Strs.	Rs.	As.	P.	£. s. d.
Total Traffic for the week ...	23,322	10,674	10	0	1,524	10	3	1,03,012	20
Or per mile of Railway	223	117	8	10	13	9	11	903	0
For previous 21 weeks of half-year	8,41,311	3,27,659	8	5	20,036	10	6	22,14,361	37
Total for 22 weeks	8,64,633	3,44,554	0	0	21,560	0	9	23,23,374	17
COMPARISON.									
Total for corresponding week of previous year	27,044	18,360	6	7	1,408	17	4	80,705	18
Per mile of Railway corresponding week of previous year	244	183	11	5	12	0	10	703	0
Total to corresponding date of previous year	6,49,203	2,35,360	9	61	30,741	7	10	22,04,637	251

CALCUTTA AND SOUTH-EASTERN STATE RAILWAY.

Approximate Return of Traffic for Week ended 28th May 1870 on 28 miles open.

		Rs.	As.	P.	Mds. Strs.	Rs.	As.	P.	£. s. d.
Total Traffic for the week ...	5,219	937	12	2	95	15	7	10,244	20
Or per mile of Railway	186	33	7	10	3	7	0	367	0
For previous 6 weeks of half-year	39,743	7,127	14	0	712	15	0	81,202	20
Total for 7 weeks	44,962	8,065	10	9	807	11	4	92,367	0
COMPARISON.									
Total for corresponding week of previous year	5,061	910	8	3	84	5	7	14,136	0
Per mile of Railway corresponding week of previous year	181	32	13	4	3	0	2	505	0
Total to corresponding date of previous year	41,813	8,063	5	42	733	12	7	1,30,997	5

EAST INDIAN RAILWAY MAIN LINE.

Approximate Return of Traffic for six days ended 4th June 1870 on 1,191½ miles open.

	COACHING TRAFFIC			MERCHANDISE AND MINERAL TRAFFIC			Total Traffic Receipts.
	Number of Passengers.	Coaching Receipts.		Weight carried.	Receipts.		
		Rs. As. P.	£ s. d.	Mds. Srs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week	87,749	96,104 7 11	8,809 11 7	7,24,910 20	4,40,027 12 5	46,843 17 7	49,635 0 2
Or per mile of Railway	73,649	81,444 11 11	7 15 9	6,083 14 1	3,684 5 1	31 2 8	45 18 6
For previous 21 weeks of half-year	23,33,839	30,22,303 13 9	3,69,547 14 1	1,52,80,360 20	88,24,497 1 4	6,08,912 3 8	11,68,456 18 9
Total for 22 weeks	24,21,547	30,18,440 5 8	3,67,354 5 8	1,60,14,280 0	92,70,524 14 1	6,49,796 2 3	12,78,162 7 11
COMPARISON.							
Total for corresponding week of previous year	63,417	1,06,035 13 4	9,003 5 7	7,35,692 20	4,21,081 10 2	53,654 3 0	48,657 8 7
Per mile of Railway corresponding week of previous year	53,181	90 8 5	8 15 2	6,180 0	3,572 10 6	34 8 0	42 18 8
Total to corresponding date of previous year	21,86,239	32,70,724 15 8½	3,60,809 2 7	1,05,43,907 30	91,48,554 4 8	8,65,039 0 3	11,55,367 8 10

EAST INDIAN RAILWAY JUBBULPORE LINE.

Approximate Return of Traffic for six days ended 4th June 1870 on 223 miles open.

		Rs. As. P.	£ s. d.	Mds. Srs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week ...	3,204	9,300 4 6	871 18 8	43,430 10	13,708 2 0	1,201 11 7	2,073 8 3
Or per mile of Railway ...	14,400	42 10 3	3 18 2	194 0	61 12 6	5 7 6	9 5 11
For previous 21 weeks of half-year	1,01,645	5,33,255 14 8	36,510 7 7	1,16,414 6	2,83,271 3 6	24,133 3 10	54,082 11 6
Total for 22 weeks	1,04,849	5,42,576 3 8	37,321 1 8	1,20,843 10	2,76,979 6 0	26,334 16 8	56,156 18 8
COMPARISON.							
Total for corresponding week of previous year	2,090	6,053 1 8	554 17 4	49,247 30	11,098 12 0	1,000 17 6	1,654 15 1
Per mile of Railway corresponding week of previous year	9,363	27 2 3	2 0 0	216 0	53 15 11	4 18 6	7 8 6
Total to corresponding date of previous year	73,431	2,16,959 12 7	19,657 10 6	10,67,120 0	2,82,823 3 8	26,587 8 3	46,455 8 9

EASTERN BENGAL RAILWAY.

Approximate Return of Traffic for Week ended 4th June 1870 on 113½ miles open.

		Rs. As. P.	£ s. d.	Mds. Srs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week ...	24,147	14,276 10 0	1,368 13 10	1,01,615 19	15,004 10 10½	1,074 13 7	2,067 7 5
Or per mile of Railway ...	213	126 1 0	11 11 1	892 0	130 12 5	14 12 11	26 4 0
For previous 21 weeks of half-year	5,06,099	8,44,904 0 0	31,395 0 8	23,28,671 17	3,03,074 3 3	33,289 10 1	64,664 10 9
Total for 22 weeks	5,30,246	8,59,180 10 0	32,763 14 0	24,29,886 36	3,51,108 14 11	34,910 9 5	67,931 4 3
COMPARISON.							
Total for corresponding week of previous year	24,381	15,908 0 7½	1,440 12 11	97,206 94½	20,927 12 0½	1,264 6 11	3,312 18 10
Per mile of Railway corresponding week of previous year	213	136 8 9	12 16 10	859 0	179 9 4	14 9 3	29 5 1
Total to corresponding date of previous year	5,05,497	8,51,164 0 12	32,100 4 9	23,01,693 20	4,24,002 14 2	31,572 8 8	71,002 9 5

CALCUTTA AND SOUTH-EASTERN STATE RAILWAY.

Approximate Return of Traffic for Week ended 4th June 1870 on 28 miles open.

		Rs. As. P.	£ s. d.	Mds. Srs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week ...	5,102	912 10 3	91 7 3	13,092 12	677 8 0	57 15 1	140 0 4
Or per mile of Railway ...	186	32 9 6	3 5 2	470 0	24 10 0	2 1 5	5 0 5
For previous 4 weeks of previous year	40,092	8,003 10 0	806 11 4	92,857 0	3,393 2 0	339 4 8	1,145 16 7
Total for 10 weeks	45,194	8,915 5 0	897 18 7	1,05,949 12	3,660 11 0	396 19 4	1,294 16 11
COMPARISON.							
Total for corresponding week of previous year	4,145	801 4 0½	73 8 11	15,760 20	1,383 2 0	126 10 5	200 8 4
Per mile of Railway corresponding week of previous year	148	28 9 10	2 12 0	563 0	49 7 8	4 10 8	7 8 2
Total to corresponding date of previous year	40,750	8,304 9 5½	867 1 0	1,36,747 23	7,048 0 1	725 12 5	1,533 13 11

Meteorological Telegraphic Report for the period 11th to 17th June 1870.

STATIONS.	Date.	Hour.	Barometer reduced to 32°.	Barometer reduced to sea-level.	THERMOMETER.		Humidity Bar. = 100.	WIND.		Rain.	Weather initials.	Clouds.
					Dry.	Wet.		Direction.	Velocity.			
CALCUTTA.	June.				☉	☉				Inches.		
	11th	10	29.721	29.739	89.4	83.0	71	SSW	...	...	...	CK
		10	29.693	29.711	93.6	80.7	58	S by W	...	...	...	K, CS
	12th	10	29.717	29.735	91.4	82.4	66	S	...	...	...	K, C
		10	29.695	29.633	91.7	82.7	...	S	...	...	...	K
	13th	10	29.740	29.754	88.0	83.0	70	SSW	...	...	...	K
		10	29.674	29.692	88.0	81.5	81	S	...	0.30	...	K
	14th	10	29.604	29.710	90.0	81.3	87	SSW	...	...	...	K
		10	29.596	29.614	91.4	80.2	67	SSW	...	...	...	K
	15th	10	29.638	29.676	90.6	82.5	68	SSW	...	...	...	K
		10	29.493	29.513	89.9	81.6	81	SSW	...	...	...	K, N
	16th	10	29.493	29.511	84.5	81.0	85	S	...	0.05	d, t	KN
BAY OF ISLAND.		10	29.471	29.432	82.0	80.7	81	S	...	0.12	o	...
	17th	10	29.510	29.518	85.0	83.4	81	S by W	...	...	...	K
		10	29.445	29.493	82.0	81.0	81	ESE	...	0.80	...	N
	11th	10	29.758	29.769	91	84	73	SW	2	...	...	N
		10	29.628	29.635	90	83	78	SSW	2	...	...	N
	12th	10	29.717	29.743	88	84	83	SSW	2	...	...	N
		10	29.610	29.616	90	84	78	SSW	2	...	...	N
	13th	10	29.770	29.776	86	83	80	WSW	1	...	...	N
		10	29.680	29.680	85	81	83	SW	1	...	...	N
	14th	10	29.706	29.711	90	85	80	W	1	...	...	N
		10	29.617	29.623	80	84	76	SSW	2	...	...	N
	15th	10	29.637	29.645	89	84	80	WSW	2	...	...	N
CHITTAGONG.		10	29.520	29.521	80	85	78	SSW	1	...	...	KS
	16th	10	29.603	29.609	81	81	73	WSW	2	...	...	N
		10	29.490	29.498	91	84	73	SW	2	...	...	N
	17th	10	29.630	29.636	91	86	80	W	...	...	...	N
		10	29.400	29.406	91	84	73	S	1	...	...	N
	11th	10	29.696	29.704	90	83	80	SSW	7.5	...	...	K
		10	29.611	29.710	91	83	70	W	13.0	...	...	K, K
	12th	10	29.711	29.691	87	82	70	S	7.5	...	...	K, KS
		10	29.604	29.713	88	81	72	SW	15.0	...	...	K, KS
	13th	10	29.714	29.721	91	82	66	SE	8.7	...	...	K
		10	29.612	29.722	84	81	87	S	9.4	...	...	KS
	14th	10	29.654	29.707	78	77	85	ESE	4.1	1.21	r, g	N
MADRAS.		10	29.675	29.645	83	80	76	S	7.5	...	...	KS, K
	15th	10	29.698	29.708	83	80	87	WSW	8.2	...	...	N
		10	29.447	29.694	80	83	66	SW	8.0	...	...	K, CK
	16th	10	29.543	29.654	88	83	80	SW	6.0	...	...	K, KS
		10	29.115	29.622	90	88	73	SW	13.1	...	...	K, CS
	17th	10	29.535	29.644	82	81	73	ESE	6.0	1.00	...	K
		10	29.425	29.633	89	83	93	SW	13.1	...	...	K, CS
	11th	10	29.734	29.754	91	77	43	W	5.0	...	...	...
		10	29.612	29.743	91	76	53	S by E	10.0	...	...	...
	12th	10	29.731	29.761	85	78	71	W	9.0	3.10	...	...
		10	29.536	29.618	84	77	68	ESE	12.0	...	...	...
	13th	10	29.737	29.767	88	70	44	S	4.0	3.24	...	...
CUTTACK.		10	29.624	29.654	86	80	75	SSE by S	11.0	...	...	...
	14th	10	29.680	29.730	84	77	71	SSE by S	14.0	0.06	...	...
		10	29.541	29.611	87	79	69	SSE by S	12.0	...	...	...
	15th	10	29.626	29.715	83	80	60	WSW	9.0	0.03	...	...
		10	29.548	29.673	87	79	49	NW by N	10.0	...	...	...
	16th	10	29.680	29.719	91	75	44	W	14.0	...	...	...
		10	29.556	29.686	94	74	40	SW	10.0	...	...	...
	17th	10	29.606	29.696	90	77	53	WSW	14.0	...	...	...
		10	29.552	29.683	94	76	58	WSW	14.0	...	...	...
	11th	10	29.698	29.770	92	82	63	SW	13.0	...	...	KS, CK, N
		10	29.541	29.692	95	81	62	SE	18.0	...	...	KN, CK
	12th	10	29.688	29.769	92	83	63	S by W	8.0	...	...	C, K, KS, N
AYR.		10	29.589	29.620	95	81	59	S	21.0	...	...	KS, CK
	13th	10	29.698	29.770	91	83	70	S	12.0	...	...	KS, CK, N
		10	29.613	29.694	93	81	67	S	21.0	...	...	KS, N
	14th	10	29.688	29.719	93	81	67	SW	15.0	...	...	C, CS, CK, N
		10	29.629	29.610	95	81	62	S	17.0	...	...	C, CK, N
	15th	10	29.697	29.674	96	82	65	SW	16.0	...	...	CK, CS, KS
		10	29.458	29.640	93	81	57	W by S	23.0	...	...	N, KS, CK
	16th	10	29.667	29.638	94	84	64	SW	16.0	...	...	KS, CK
		10	29.440	29.580	91	81	63	S	16.0	...	...	KS, CK, N
	17th	10	29.427	29.668	92	86	57	NW	10.0	...	...	CK, C
		10	29.409	29.401	80	78	68	E	28.0	...	...	KS, C
	11th	10	29.800	29.745	94	80	88	Calm	...	...	...	C, CK, CS, KS
		10	29.739	29.751	96	80	75	NW	1	...	...	KN, CK
AYR.	12th	10	29.835	29.840	89	78	82	Calm	...	0.30	...	KS
		10	29.815	29.839	91	77	69	NW	1	1.50	...	C, CS, K
	13th	10	29.820	29.832	91	80	83	SSW	1	...	...	KS
		10	29.743	29.758	87	81	76	SW	1	...	...	C, CK
	14th	10	29.744	29.759	93	79	83	NW	1	1.40	...	CS, KS
		10	29.607	29.712	89	78	89	Calm	...	0.10	...	C, CS, CK, N
	15th	10	29.743	29.748	89	80	87	Calm	...	0.20	...	C, CS, N, KS
		10	29.536	29.651	86	80	75	SSW	1	...	...	CK, N
	16th	10	29.711	29.726	84	80	83	Calm	...	1.50	...	C, CS, CK
		10	29.612	29.627	86	80	75	WNW	2	...	...	KS, N
	17th	10	29.603	29.614	84	79	79	SSW	1	0.50	...	C, CK
		10	29.600	29.675	85	80	79	SW	1	...	...	C, CS, CK

* Velocity of wind in miles per hour.

CALCUTTA,
The 18th June 1870.HENRY F. BLANFORD,
Meteorological Reporter to the Govt. of Bengal.

Weekly Report of Rainfall compiled at the Meteorological Reporter's Office.

Circuits.	Stations.	Rainfall from 30th May to 5th June 1870.	Rainfall from 5th to 12th June 1870.	Rain from 1st January 1870.		Remarks.
				Rain.	Up to date.	
SOUTH-WESTERN.	Pooree	Nil	Not received	0.21	5th June 1870.	
	Palae Point	Not received	ditto	2.00	29th May 1870.	
	Cuttack { Telegraph Office	0.50	0.70	5.70	12th June 1870.	
	{ Jail...	0.00	Not received	5.02	5th June 1870.	
	Samalpur	Not received	ditto	4.00	29th May 1870.	Not received 7th to 15th March, 11th to 17th April, 25th April to 1st May, and 8th to 32nd May.
	Balasore	Nil	ditto	5.67	5th June 1870.	
	Midnapore	0.50	ditto	4.20	ditto.	
	Banarora	1.30	ditto	4.53	ditto.	
	Chyebassa	0.53	0.78	5.95	12th June 1870.	
	Parulia	0.02	0.40	5.08	ditto.	
WESTERN.	Gubindpore	0.29	Not received	0.08	5th June 1870.	Not received 1st January to 22nd May.
	Bardwan	2.19	0.51	6.40	12th June 1870.	
	Raneegunge	0.80	2.12	6.06	ditto.	Not received 1st to 8th May.
	Konore	1.08	0.74	4.81	ditto.	
	Dagghur	Nil	Not received	2.74	5th June 1870.	
	Burra	ditto	0.40	1.85	12th June 1870.	Not received 3rd to 10th January and 7th February to 6th March.
	Hazareebaugh	ditto	Not received	1.93	5th June 1870.	
	Rancha	0.29	1.54	2.89	12th June 1870.	Not received 1st January to 20th March.
	Bassorah	Nil	0.16	0.50	ditto.	Not received 1st January to 27th March.
	Sangor Island	0.50	0.10	7.40	ditto.	
CENTRAL.	Cantai	0.50	0.73	3.70	ditto.	
	Calcutta	2.78	0.63	8.17	ditto.	
	Bowrah	1.08	0.62	8.17	ditto.	
	Allipore	3.32	0.52	3.84	ditto.	Not received 1st January to 20th May.
	Barrackpore	Not received	Not received	0.30	29th May 1870.	Not received 1st January to 15th May.
	Dum-Dum	ditto	ditto	0.18	ditto.	ditto.
	Baran	ditto	ditto	1.90	ditto.	ditto.
	Sackbarah	ditto	ditto	4.44	ditto.	ditto.
	Boserhat	ditto	ditto	1.00	ditto.	ditto.
	Diamond Harbour	ditto	ditto	1.90	ditto.	ditto.
NORTH-WESTERN.	Barripore	ditto	ditto	2.81	ditto.	ditto.
	Hoochly	0.72	1.03	8.71	12th June 1870.	
	Jessore	0.81	0.52	13.55	ditto.	
	Kishunghur	2.03	0.81	7.79	8th June 1870.	Not received 1st to 18th Jan. and 4th to 10th April.
	Ranaghat	1.20	Not received	4.55	12th June 1870.	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
	Bongong	0.95	2.30	7.30	5th June 1870.	Not received 1st to 6th Jan. and 4th to 10th April.
	Moharpore	0.70	Not received	3.00	12th June 1870.	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
	Choudangah	0.50	ditto	7.00	5th June 1870.	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
	Kopaiten	2.40	0.12	8.85	12th June 1870.	
	Bachampore	4.66	Not received	4.53	5th June 1870.	
SOUTH-EASTERN.	Furzedpore	0.10	ditto	15.80	ditto.	
	Barrinaul	0.46	3.47	17.23	12th June 1870.	
	Bhangulpore	Nil	0.78	2.36	ditto.	
	Mudhayspore	ditto	0.90	2.69	ditto.	Not received 1st Jan. to 1st May.
	Banks	1.00	0.06	2.16	ditto.	Not received 1st Jan. to 25th April and 23rd to 29th May.
	Monghyr	Nil	0.96	1.67	ditto.	
	Jamoot	2.16	0.48	2.71	ditto.	Not received 1st Jan. to 24th April.
	Begootari	0.03	0.34	0.43	ditto.	Not received 1st January to 15th May and 23rd to 29th May.
	Gya	Nil	Nil	1.51	ditto.	Not received 1st to 10th Jan. and 11th to 17th April.
	Behur	ditto	Not received	0.78	5th June 1870.	Not received 1st Jan. to 20th March.
SOUTH-EASTERN.	Purna	ditto	ditto	1.06	ditto.	
	Mudhows	ditto	Nil	1.00	12th June 1870.	Not received 1st Jan. to 24th April.
	Barb	0.10	Not received	0.23	5th June 1870.	Not received 1st Jan. to 15th May.
	Arrah	Nil	0.10	2.10	12th June 1870.	
	Paxar	ditto	Not received	1.37	5th June 1870.	
	Chuprah	ditto	0.03	0.99	12th June 1870.	
	Sewan	0.21	Nil	0.83	ditto.	Not received 1st Jan. to 1st May.
	Chumpan	Not received	Not received	3.00	20th May 1870.	Not received 2nd to 10th Jan.
	Banar	Nil	ditto	0.51	5th June 1870.	
	Mozulpore	0.50	0.80	4.0	12th June 1870.	Not received 1st Jan. to 23th Feb.
SOUTH-EASTERN.	Diunpore	Nil	0.38	1.34	ditto.	Not received 1st Jan. to 13th Feb.

CIRCULAR.	STATIONS.	Rainfall from 30th May to 31st June 1870.	Rainfall from 1st to 12th June 1870.	RAIN FROM 1st JANUARY 1870.		REMARKS.
				Rain.	Up to date.	
NORTHERN.	Rampore Beaulah	0.61	1.08	4.07	12th June 1870.	
	Natore	1.41	0.21	4.68	ditto	Not received 1st Jan? to 1st May.
	Pabna	1.06	0.83	7.08	ditto.	
	Commerally	2.08	Not received	7.47	6th June 1870...	Ditto ditto.
	Sorajganga	0.33	ditto	2.63	ditto	Not received 1st Jan. to 15th May.
	Mallah	0.73	ditto	2.03	ditto.	
	Bogra	0.16	ditto	8.86	ditto	Not received 1st to 9th Jan. and 2nd to 8th May.
	Dinapore	2.33	ditto	7.41	ditto	Not received 14th to 20th Feb.
	Bangpore	2.00	ditto	12.00	ditto	Not received 10th to 28th Jan., 2nd to 27th Feb., and 7th March to 3rd April.
	Buxa	Not received	ditto	10.00	30th April 1870.	
NORTH-EASTERN.	Bungbes	ditto	ditto	12.43	ditto.	
	Darjeeling { Telegraph Office	ditto	ditto	18.67	31st May 1870.	
	{ Jail	0.82	ditto	18.23	5th June 1870.	
	Sowalparah	7.09	ditto	10.45	ditto.	
	Dobree	3.65	ditto	3.65	ditto	Not received 1st to 30th May.
	Gowahatty	1.47	ditto	10.37	ditto.	
	Shillong	1.73	ditto	12.03	ditto.	
	Runklow	Not received	ditto	8.49	30th April 1870.	
	Nawrong	ditto	ditto	14.80	29th May 1870...	Not received 2nd to 6th May.
	Tezpur	ditto	ditto	22.00	ditto.	
EASTERN.	Dholebagauts	3.00	ditto	20.38	5th June 1870..	
	Sachrangur	Not received	ditto	18.60	29th May 1870.	
	Debrooghur	ditto	ditto	36.18	ditto	Not received 1st to 9th Jan.
	Samsodgoding	ditto	ditto	11.00	ditto	Not received 1st and 2nd Jan.
	Dacca { Telegraph Office	ditto	ditto	4.17	30th April 1870.	
	{ Jail	0.10	ditto	7.36	6th June 1870	Not received 10th to 16th Jan. and 14th to 20th Feb.
	Mymensing	0.37	ditto	8.54	ditto	Not received 3rd to 9th Jan. and 28th March to 17th April.
	Sylhet	2.63	ditto	20.54	ditto.	
	Cachar	8.62	ditto	17.03	ditto.	
	Assamkhal Hylakandy	8.64	ditto	10.00	ditto.	
SOUTH-EASTERN.	Tipperah	2.50	ditto	13.66	ditto.	
	Noakhully	Nil	ditto	0.98	ditto	Not received 14th to 30th March.
	Chittagong { Telegraph Office	1.10	1.30	16.30	12th June 1870.	
	{ Jail	0.85	Not received	8.38	6th June 1870.	
	Ranganates Hill	3.60	ditto	17.00	ditto.	
	Akyab	4.10	6.00	35.60	12th June 1870.	

CALCUTTA,
The 18th June 1870. }

HENRY F. BLANFORD,
Meteorological Reporter to the Government of Bengal.

Results of the Meteorological Observations taken at the Surveyor-General's Office, Calcutta, from 8th to 14th June 1870.

Month.	Date.	Mean reduced Barometer.	THERMOMETER.		Max. Solar radiation.	Mean Dry Bulb.	Mean Wet Bulb.	Computed Mean Dew-point.	Mean degree of humidity.	Wind.			Rain.	GENERAL REMARKS.
			Highest Reading.	Lowest Reading.						Prevailing direction.	Max. pressure.	Mean velocity.		
		Inches.	°	°	°	°	°	°	°		lb.	Miles.	Inches	
June	8th	29.687	92.8	84.2	127.3	87.7	81.3	77.5	0.78	S S W	1.4	405.6	...	Stratocumuli and clear. Brisk wind from 8½ to 9½ A.M.
	9th	29.606	93.8	77.8	138.6	87.3	80.8	70.4	.71	S S W	2.8	376.3	0.63	Clouds of different kinds. Brisk wind at 4 and 7½ P.M. Thunder, lightning, and rain between at 8.25 P.M.
	10th	29.659	92.7	80.3	127.0	86.1	80.8	77.1	.76	S S W & S by W	...	298.8	...	Overcast and cirri. Drizzled at 9½ A.M.
	11th	29.652	94.5	82.5	130.0	87.6	81.2	77.4	.73	S & S by W	0.2	370.2	...	Cirri, cirrocumuli, & cumuli.
	12th	29.670	94.8	82.5	138.6	88.0	81.4	77.4	.79	S by E & S	...	392.0	...	Clear, cumuli, and cirri.
	13th	29.701	90.7	80.0	109.8	83.7	79.0	77.2	.81	S & S by W	...	244.1	0.30	Cirri, overcast, and stratocumuli. Thunder at 11½ A.M. Lightning to S. W. at 8 P.M. Slight rain from 9½ A.M. to 1 P.M., and at 6½ P.M.
	14th	29.640	91.7	80.5	128.8	86.0	80.4	76.5	.74	S S W & S by W	...	152.8	...	Clouds of different kinds.

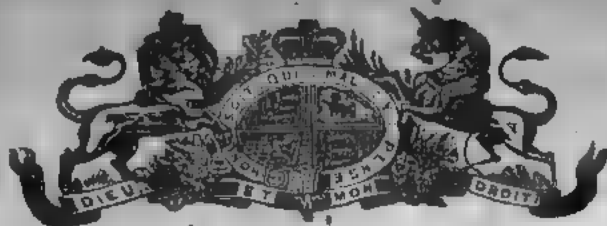
The mean Barometer, as likewise the Dry and Wet Bulb Thermometer means, are derived from the twenty-four hourly observations made during the day.

The Dew-point is computed with the Greenwich constants.—The figures in column ten represent the humidity of the air, the complete saturation of which being taken at unity.—The receiver of the lower rain gauge is 1½ feet, and that of the Anemometer 70 feet 10 inches, above the level of the ground.—The velocity of wind, as indicated by Robinson's Anemometer, is registered from noon to noon.

The extreme variation of temperature during the past seven days			...	17.0
The max. temperature during the past seven days			...	94.8
The max. temperature during the corresponding period of the past year			...	97.0
The mean humidity during the past seven days			...	0.74
The mean humidity during the corresponding period of the past year			..	0.84
				Inches:
The total fall of rain from 8th to 14th			{ by lower rain gauge	.. 0.93
			{ by Anemometer gauge	.. 0.80
Ditto	ditto,	average of sixteen previous years	..	3.91
Ditto		between the 1st January and the 14th current	..	9.47
Ditto	ditto	ditto, average of 16 years...	..	16.98

GOPEENATH SEN,
In charge of the Observatory.

The 17th June 1870.



SUPPLEMENT TO The Calcutta Gazette.

WEDNESDAY, JUNE 29, 1870.

OFFICIAL PAPERS.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT, separately, on payment of six Rupees per annum if delivered in Calcutta, or twelve Rupees if sent by Post.

Report on the endemic malarious fever of the Hooghly District, by the Sanitary Commissioner for Bengal.

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From DAVID B. SMITH, Esq., M.D., Sanitary Commissioner for Bengal, to A. MACKENZIE Esq.,
 Officiating Junior Secretary to the Government of Bengal, (No. 258, dated Calcutta,
 the 12th May 1870.)

I HAVE the honor to report, for the information of the Government, that I have recently completed a careful inspection of a large portion of the Hooghly district.

2. Bearing in mind the opinion expressed by the Lieutenant-Governor—that there is nothing more urgently calling for attention and for careful investigation than the conditions and circumstances of the fever which has so severely prevailed in Lower Bengal—I determined to make myself personally familiar with the sanitary condition of the Hooghly district, chiefly in relation to the prevalence (past and present) of the said malarious fever.

3. My tour commenced on the 9th of February and lasted until the 18th of April—69 days.

4. More than four hundred villages in the district have been carefully visited, and upwards of 700 miles travelled over (450 of which were accomplished on horseback.)

5. The annexed list of places indicates the parts of the country inspected; and the route followed is shown on the accompanying map by a dotted line (red.)

6. Besides the places noted, careful enquiry was made regarding many others; and hundreds of hamlets were passed through, to which no detailed reference appears necessary.

7. I went among the people in their village homes, (leaving roads and beaten tracks as much as possible); observed their present condition; sought from them information regarding the past; encouraged them to show their sick; examined the internal characteristics and the general surroundings of villages; and, not trusting to memory, jotted down, on the spot, any observations which appeared worthy of record. Thus my opinions are strictly based on notes which were always recorded at the places to which they refer.

8. As will be seen from the accompanying Map, all the parts of the district were inspected between *Selimabad* and *Shankrail*, and from *Pundooah* to *Amptah*; and, in a more general way, as far west as *Jehanabad*.

9. All rivers and water-courses were inspected with special care. The *Damoodah* was followed from *Mymaree* to *Moishraka*, and places situated on both sides of it visited. The former courses of the original *Damoodah*, marked on the map as the *Kana Damoodah*, and *Kana Nuddes* or *Koontee*, were then examined from one end to the other, and many villages on or near those old rivers, throughout their entire length, were seen. The *Chessa Nuddes*, with its three main branches, was next traced from its source in the fields beyond *Goorooop* to its junction with the *Koontee*, at the small village of *Karchoe*; and the country on both sides of this river was also carefully gone over. Next, the *Shursuttee Nuddes* was seen throughout its whole course, from *Trebani Ghât* to the Hooghly below Fort Gloucester, and the condition of localities on both sides of it was investigated. The *Rajapoor Bheel*, in the southern portion of the district, was visited; and the *Dancoonee jhollas* which lie between the *Sursuttee* and Hooghly rivers. Places near portions of the *Roopmarain*, *Dalkissur*, and *Selye* rivers were also examined; and a few very old river-beds,—now almost obliterated—such as the *Kedarnuttee* at *Dwarbashinee* and the *Koseye* at *Pundooah*, were likewise studied, and their former history enquired into. Lastly, the *khâls* near *Mugra*, *Chandernagore*, *Baly*, and *Bydebattee* were seen. Thus I have traversed great part of the district,—observing its streams (with their embankments), its dead rivers, tidal creeks, marshes and low-lands, its roads, bridges, railway embankments and cuttings, tanks, jungles, and drainage-outlets,—considering the probable influences of all these upon public health,—collecting as many trustworthy facts as possible, and placing value only on such inferences as resulted from fair and strict induction.

10. On the accompanying Map (the preparation of which Captain W. G. Murray, of the Topographical Survey, has very kindly superintended) it is attempted to show where fever has most prevailed throughout the parts of the district visited.

For convenience of illustration, four degrees of intensity are pre-supposed:—Places which have all along been comparatively free from sickness are indicated by a plain circle, unshaded; those that have been affected to a considerable degree are shown by a half-shaded, (red) circle; those affected severely are represented by three quarters of the circle being colored red; whilst the localities where disease has been very intense are marked by a complete red circle.

11. The places which, on the whole, suffered most, as far as I could learn, were the following:—

Parambo, Shah-Bazaar, Gungasnuggur, Robeerampore, Khanpore, Dhunneakhally, Allah-Peetay, Shumushpore, Mahmoodpore, Gonraspore, Bindrampore, Dwarbashinee, Sham-pore, Joynuggur, Doarhatta, Sonatigree, Jotomadub, Bailya, Adjudhia, Chandbattee, Pauch-gatehia, Gopenathpore, Kishtonuggur, Mohundbattee, Pershadpore, Shubblepore, Dinglehattee, Govindpore, Poobpara, Goalpota, Moondleekia, Morrah, Rajipore, Pooriarpore, Tengra, Balghur, Jehanabad, Amptah, Selimabad, Nanda, Pundooah.

12. Next to these, in point of severity of attack, were Jagram, Moholla, Myapore, Horipaul, Deepay, Paharpore, Ramnuggur, Joyjeelunpore, Kassipore, Sooltanpore, Sreeram-pore, Juggenathpore, Colesinee, Kowtuckpore, Byheregurrah, Echanuggur, Juggutbulubpore, Torā, Gojja, Betrogur, Paratol, Bahadoorpore, Baldanga, Konān, Kamalpore, Kenkracoollee, Hajipore, Booshooa, Harpore, Ramesseurpore, Polimpore, Chatra, Neasserai, Trebani, Joypore-Bigattee.

13. I visited all the above places; the rest appear to have escaped with considerably less mortality.

14. The years during which sickness most prevailed in different localities are also marked on the map, and shown by lines of different colors, as suggested by the Secretary to the Government of Bengal in the Public Works Department in his No. 2715, dated 10th May 1869.

15. Thus, as far as possible, the results of recent investigation regarding the fever have been charted, so that a general impression on the subject may be realized almost at a glance.

16. Last year I brought to the notice of the Government observations establishing the fact that the people of the Hooghly district were then in a most pitiable disease-stricken and helpless state. Fortunately the past year has been one of great change for the better in the sanitary condition of this part of the country. The influence of malaria seems to have been much less intense than in immediately previous years; sickness has neither been so severe nor so prevalent as before; the general aspect of the people has improved to a marked degree; the terrible pictures of misery that formerly presented themselves are happily no longer to be seen; the rates of mortality are now greatly diminished; urgent appeals for relief are far less frequent than before; there is much less suffering and less apathy. In a word, the people are regaining vigor, hope, and happiness. It affords me much pleasure to be able to report that in no part of the district is a great deal of sickness at present prevailing. There is nothing like what was observable in many parts of the same district at the corresponding season of last year.

17. I would not, by any means, have it understood that there is no sickness at all observable. Such a statement would be incorrect. In some places, such as *Govindpore*, *Perhadpore*, *Poobpara*, *Dinglehattes*, and other villages in their vicinity, the people are still suffering a good deal, but this is now much rather the exception than the rule.

18. The still existing proofs that great sickness and a very high mortality occurred, within the last seven or eight years, lie in the statements and recollections of the people, in the number of dilapidated and deserted houses, in the great reduction of population; in the comparative infrequency of old age and infancy, in the vast number of conspicuously enlarged spleens, in the extremely common marks of the cautery on the left side, and in the too conspicuous signs of past mortality even now apparent, to which I shall have more particularly to allude.

19. Many of the places reported on last year were revisited—such as *Mohundhattes*, *Dwarbashinee*, *Mahmoodpore*, *Allah*, &c., &c.

I went back to the first of these villages with particular interest, as it was in so lamentable a condition last year. I found a completely altered and happier state of things. The people on all sides were working, talking, and laughing, where formerly they were so miserable. Still signs of past suffering were by no means absent; the first child seen on approaching the village had 32 circular cautery marks over the spleen and liver; this severe treatment had probably saved his life.

At *Dwarbashinee* a large number of broken-down and deserted huts, surrounded by tangled underwood, show what happened in the past; but, on arrival there, I was glad to find three new tanks being dug—one very large, for drinking purposes only, and two others for bathing and washing. I was informed that three or four hundred Dhangur coolies had been engaged at this work for three months, and when I came to the spot—quite unexpectedly—I found them all busily employed. Undertakings of this kind must prove of great value to the people both now and in the future.

20. During my tour information was collected regarding cholera, *gâitre* and cattle plague, but I think it will be well to reserve the notes on these subjects for separate submission to the Government.

21. It was formerly reported that the Hooghly fever is of endemic malarious origin and non-contagious. The more the subject is enquired into, the more certainly will this fact be placed beyond question, and it is one of no slight practical importance. I would have it particularly understood that the disease is still present in most parts of the district, although in a very mitigated form, as might be expected at this season of the year. It has not, however, passed altogether away, as a genuine epidemic disease would have done. There is a lull for the present. The favoring conditions are for the time being in abeyance, and other collateral circumstances seem also to be operating more feebly than before. This is all that can be said; and for practical purposes, it is of great moment that the subject should be viewed in this light. Unless the fever be disarmed of its power whilst it is in abeyance, it will be liable at any time to spring up anew, re-producing the same fatal results which attended its previous action.

22. With regard to the exact nature of the fever, I have had frequent opportunities during the past year of observing persons actually suffering from it in all its different stages, and it may be confidently laid down that in its milder form it is a genuine intermittent, which, if it advances unchecked, often merges into the type of disease known by medical men as "adynamic remittent." It is at first characterized by great debility, want of appetite,

languor, loss of nervous power, regular exacerbations and remissions, with congestion and engorgement of internal organs, chiefly of the spleen and liver. Those who have suffered long or severely present enlarged or indurated spleen, bloodless conjunctiva, pale lips, sometimes a scorbutic taint, and a peculiar dark, cloudy or smokey appearance of the countenance. In worse cases we find splenic diarrhoea, or dysentery, enlargement of the liver, dropsy, general anasarca, functional disease of the heart, great emaciation, and it may be partial jaundice. In the more advanced stages of the disease, the parotid and sub-maxillary glands are liable to enlargement and suppuration; and sloughing of the mucous membrane of the mouth (Canorom oris) is not uncommon in weak subjects; diffuse abscesses or sloughing scres also occur; the patient becomes fearfully reduced, and ultimately succumbs in the majority of cases from congestion of the lungs and brain.

Such is the disease known by the natives of Bengal as *jor behar*. In its early stages it is recognized as *notun jor*—new fever; whilst the chronic form of it is termed *poorottun jor*—old fever.

I have thought it well thus briefly to identify the malady, chiefly because it was stated by the members of the English War Office Sanitary Commission, in their reply to Sir Stafford Northcote's reference to them on the subject, that no account of the nature of the fever had been submitted to them. I would, however, remark that this point was dwelt on with care by Dr. Elliot in his report of 1868, by the Special Fever Commission appointed in 1864, and by Drs. Green, Sutherland, Thompson, Mantell, and McLeod, (*vide* their reports forwarded with No. 40, dated Fort William, the 15th April 1868, from the Inspector-General of Hospitals, Indian Medical Service, to the Secretary to the Government of Bengal).

23. In my report of last year the opinion was expressed that the cause of the fever was connected with interference or obstruction (by silting or otherwise) of natural lines of surface drainage,—with alteration, drying, or partial obliteration of rivers or other water-courses, with sluggish and stagnant conditions of "ground-water," and with variations in the levels of the country generally. I still believe such to be the chief exciting causes of the disease now under consideration.

24. Passing on to the opinions of others as to the cause of the fever, it is to be noted that particular stress has been laid on many different influences which are supposed to originate or to intensify the disease. At present I shall only pass briefly in review some of the more important of those opinions, noting, in connection with them, any recent observations tending to support or to refute them.

25. It is believed by certain observers that *bad water* is alone at fault in causing fevers, such as that now under consideration, and that "malaria is not the product of either swamps, marshes, drying ground or decaying vegetation." Dr. Moore, of Marwar, may be regarded as one of the keenest exponents of this doctrine. There is much to be said in support of this opinion, and there can be but little doubt that, under certain circumstances, impure water, particularly if contaminated with vegetable organic matter, is capable of causing and does cause intermittent and remittent fever. The strongest argument to be brought against this view of the case, as an exclusive one, lies in such statements as the following which was made in 1868 by Dr. Mantell, Civil Surgeon of Burdwan, (but which some may think not sufficiently precise). He wrote:—"That the fever solely arises from the condition of the water I cannot believe, as many villages which have not suffered at all have water just as impure as those that have suffered." My own experience is that where there is an ample and pure supply of water, there is, as a rule, comparatively little fever. I remarked this particularly at such places as *Voyrambattee*, *Godepore*, *Athpore*, &c.; yet it is but right that I should add that instances of an exceptional character have also been observed. Thus, at the village of *Skampore* the people drink what appears to be good tank water; they believe it to be good, and say that it has always been good; yet great mortality has occurred there,—something like 1,000 Hindoos have died since the rainy season of 1868. Again, at the village of *Konán*, near Dhuneakhally, the source of the drinking supply seemed to be pure (above the average), yet I observed a large number of very bad cases of fever there. On the other hand, at *Polaskee*, on the *Koontes*, the people, having no tanks near them, drink the water of the old, half-dry river—a source by no means inviting—and yet it is a fact (which somewhat surprised me) that the place does not seem ever to have been particularly unhealthy, and that the mortality of late years has undoubtedly been low. Again, at *Jenkári*, a small village, situated between two great morasses, (the *Dancoonee jhollas*) the people drink from very indifferent tanks, and when these dry up, they drink the water of any pool which may be altogether surrounded by swampy ground, and yet the place has not been sickly, and but few persons have died there during the past three years.

26. The proximity of marshes and the more than usual prevalence of malarious fever have been associated together, as cause and effect, for many centuries and in many different countries. Indeed that there does exist some connection between the two is almost beyond question. Yet it is a fact that it is only certain conditions of swampy land which seem to favor the generation of the disease. These conditions have not yet been determined with sufficient precision. The little village of *Jenkári*, already mentioned, is on the edge of a vast tract of swampy country, and yet it is healthy. Not a few examples of the same kind are to be found

near and around the same place; and similarly I saw several villages near the *Rajapoor bheel*, in the southern part of the district, which were by no means very unhealthy, and yet the adjoining great swamp is of very forbidding appearance.

27. I have heard it said that this fever has been governed by "*endemic influences*," and that it has steadily progressed from east to west, or from north-east to south-west,—first showing itself in the Jessore district; then spreading across zillah Nuddea; afterwards traversing part of the 24-Pergunnahs and the Hooghly district; and finally prevailing (which it has done latterly with great severity) in the district of Burdwan. This is a subject worthy of close enquiry. It cannot be disputed that in a general way the manifestations of the disease have appeared to come from the eastward; but this passage of the disease (towards the west)—if so it may be regarded—has extended over a long series of years and has by no means been regular. Taking the description of the past history of the fever furnished by Dr Elliot, which is the most complete account available, I have had a rough chart prepared showing, in a general way, what has been the course of the disease through the districts of Jessore, Nuddea, and Baraset. It will be seen that it is far from regular.

The so-called epidemic is said first to have broken out at *Mahomedpore*, a large village on the river *Ellenkallee*, about 30 miles north-east of the station of Jessore, in the year 1824 or 1825.

It affected villages near Jessore in 1831, *i.e.*, seven or eight years later.

It did not reach *Oolah* till 1856, *i.e.*, twenty-five years later;—*Oolah* being only 32 miles west of Jessore.

From *Oolah* it passed to the north as well as to the south.

Five years later it was at *Baraset* which is 35 miles south of *Oolah*.

From *Baraset* it extended to the east and south-east.

In 1862 it was at *Pundooah*, which is about 60 miles west of Jessore; and in 1869 it prevailed severely at *Selimabad*, on the Damoodah, which is about 80 miles west of Jessore; so that the so-called epidemic took fifty-six years to pass from Mahomedpore to Selimabad, a distance of about 110 miles.

From the above facts I think it may fairly be concluded that the disease did not pass steadily from east to west or from north-east to south-west; and that if it is to be regarded as an epidemic, all must allow that it has been wonderfully protracted in its advance, inasmuch as it has been affecting a tract of country 110 miles in extent for upwards of half a century. Its past as well as its recent history proves the fever to be an endemic and not an epidemic disease.

28. The opinion that roads and railroads have at certain places obstructed local drainage,—and, in so far as they have done so, that they have contributed to the production and unusual prevalence of fever,—has been maintained chiefly by Native gentlemen. They brought forward the opinion, to which many of them, I believe, still adhere, that interference with general drainage had resulted in this way, and that it was not necessary its effects should be conspicuously visible in the main drainage channels, or in large collections of surface moisture, but that its influence might be traced in a hindrance to the gradual and almost imperceptible escape of water from low rice-fields, *dhools*, and minor channels. This question has attracted much attention, and the Government having called for the opinions of Engineers, District Officers and Civil Surgeons, numerous careful observations have been made and recorded. The results of the enquiry and the discussions regarding it are to be found in the Proceedings of the Government in the Public Works Department, Railway Branch, dated 26th June 1868, No. 12469; and in the official papers published in the Supplement to the *Calcutta Gazette* of date 28th April 1869.

There appears a great weight of argument and the decision of numerous experts against the idea that roads or railroads have interfered with surface drainage, and so caused sickness. Engineers have laid particular stress on such facts as the following: that there is ample water-way through existing culverts; that there is no "heading-up" of waters on the "up" as compared with the "down"-stream side of embankments; that, as a rule, there is no difference in rice-crops on the two sides; and, lastly, that there is no fixed relation between the unhealthiness of villages and their proximity to roads or railway embankments; that, consequently, such works cannot fairly be considered as sources of obstruction to drainage, or the causes of local unhealthiness.

My tour being made in the dry weather, I could not form any direct personal opinion on the subject, but viewing the engineering opinions which have been placed on record, considering their value and their unanimity, and having myself visited (although not during the rains) several of the localities mentioned by the British Indian Association and the Civil authorities as having suffered to an unusual degree from fever, in consequence of their drainage being interfered with by roads or by the railway, I am, on the whole, inclined to think that such causes have not originated or aggravated the fever throughout the district to anything like a wide degree; and it is certain that many portions of the district which have been affected by the fever with extreme intensity are far removed from the local influences of roads or railroads. In making this statement, I yet desire to point to the fact that somewhat undue importance seems to me to have been laid by Engineers on one or two points bearing on the subject of public health. Thus, although no "ponding up" of water may be conspicuous,

an amount of *sub-soil* stagnation may occur sufficient to be locally prejudicial to health. Such an effect might be produced whilst there was but a very slight difference in the levels of surface water on the opposite sides of an embankment.

The most important sanitary consideration, however, connected with the railway appears to be the presence of stagnant water in many places and for very long distances on both sides of the line. It has been proposed either to connect all side-cuttings, and to convert them into continuous lateral drainage channels, or to deepen the excavations, so as to have a number of tanks instead of a series of objectionable stagnant pools. The possibility of carrying out either of these plans is conceded by Mr. Leonard, and it would be well if the suggestion were still further considered and carried into effect. I have heard it argued that because vast tracts of adjoining rice country are in a swampy condition, it is quite superfluous to take into consideration the stagnation of water in side-cuttings. But the argument might well be regarded from exactly the opposite point of view, inasmuch as the presence of local stagnation of water in one place only renders the prevention of a like condition, with superadded defilement in another, the more necessary.

I should be glad to see orders passed for the systematic improvement of side-cuttings both along roads and railroads. On the whole, however, I agree with Mr. Leonard in the opinion that much more injury results from the silting up or "bunding" of old water-courses than can fairly be attributed to the indirect influence of roads or of railway embankments.

29. The cyclone of October 1864 has been regarded by some as one of the causes of the unusual prevalence of fever in the Hooghly district. On the other hand, it has also been said that "after the cyclone the malady almost entirely disappeared, and that during 1865 there was no return of it, or at least none such as to attract attention;" in 1866-67, however, it again re-appeared. My enquiries tend to show that in 1864-65 most of the sickness that could possibly be attributed to the cyclone prevailed at Oolobariah, Shankrail, Doonjoor, and perhaps as far north as Gopalnuggur. The fact, however, remains that the fever desolated many places before the date of the cyclone, and that since 1866 its ravages have also been very severe. I think we may therefore safely conclude that in a manner the cyclone may have had, from the force and extent of its ventilating power, a salutary effect; but that in so far as it ruined crops and caused the loss of property, the destruction of trees, the death of cattle, and the demolition of huts, it entailed misery, care, and poverty, all of which predisposed the lower orders of the people to attacks of fever. Further, the usual evils attending the decay of dead vegetable matter, acted on by moisture and great heat, were experienced afterwards, if not at the time of the cyclone.

30. The influence of *poor diet* as predisposing the lower orders of the people to the prevailing fever, and as increasing the mortality caused by it, is, I believe, unquestioned; yet in times of great scarcity I have seen many famine-stricken creatures who suffered and died without having enlargement of the spleen or a single attack of intermittent or remittent fever. I believe vast numbers of the people of Bengal are inadequately nourished, and that they partake too much of carbonaceous and too little of albuminous food. This probably depends, in a great measure, on their poverty; nowhere perhaps could the Roman expression—"*pecunia alit sanguis*"—hold good more truly; and yet I feel convinced that the people might be far removed from want, and comparatively well-to-do and independent, without, in consequence of this fact, escaping death from the fatal scourge malarious fever; and on this point I would draw attention to the following statement recorded by the members of the Fever Commission of 1864:—"The important fact, however, to be noticed is that of late years no deterioration has taken place in the quantity or quality of the food used. On the contrary, in every place visited by us the same story was told of an unusual prosperity, extending back for some eight or ten years among all classes of the community;" and yet fever was desolating the land.*

31. Some have thought that *differences of caste* have not a little to do with the liability to or immunity from fever; and I have heard the question put whether Mahomedans have not suffered much more than Hindoos. During my tour this question was kept before me, and in connection with it the following facts may be placed on record: many purely Hindoo villages suffered very severely, such as Poohpara, Pershadpore, Govindpore, Moholla, &c.

At Shampore also the mortality was less among the Mahomedans than amongst the Hindoos. The same occurred at Horipaul and Doarbatta.

On the other hand, some Mahomedan places, such as Selimatad and Pundooah, suffered very severely indeed; whilst others, such as Joyrambattes and Godepore—small places—were but slightly affected. At Harpore, near Dhunncakhally, the eastern or Hindoo para was severely visited, whilst the Mahomedan or western quarter was not so bad.

On the whole, however, it seems probable that the Mahomedans do suffer, proportionately, considerably more than the Hindoos. This fact is brought out in the following Table which has, along with other very interesting notes regarding the fever, been kindly furnished by

* NOTE.—It is here worth while to note the fact that the cultivation of the potato is greatly on the increase in certain parts of the district—particularly the sandy strip of country on the western side of the Damoodah. There the vegetable flourishes, and now covers large tracts of land,—fields of it being interspersed amongst those of the pumpkin, tobacco, chilli, and onion,—the last named vegetable being also now much in favor—more so than formerly.

Baboo Joykishen Mookerjee of Ooterpah. The places were taken at random, and not selected with reference to any preconceived theory:—

Names of villages.	Police division.	Hindoo population.	Hindoo deaths.	Mahomedan population.	Mahomedan deaths.
Chack	Hurripal	300	50	50	10
Jajoor	ditto	1,800	800	600	100
Middho Hilly	ditto	900	300	250	100
Bundipore	ditto	1,000	1,600	100	80
Korokpala	ditto	80	22	300	50
Danispore	Dhannaskhally	391	215	125	54
Pittah	ditto	148	93	288	189
Hurypore	ditto	613	49	930	175
Khurast	ditto	375	179	450	48
Secunderpore	ditto	80	12	180	139
Gantagory	ditto	195	84	403	190
Gungasuggur	ditto	300	88	600	180
Pundooah	ditto	375	241	800	588
Mehannad	Pundooah	1,167	993	5,804	4,429
	Bansheria	1,557	389	800	600
		10,951	4,715	11,490	6,816

This Table, if it be correct, shows that the deaths to population among Hindoos, at the places noted, occurred at the rate of 27·25 per cent.; and amongst Mahomedans at the rate of 59·46 per cent.—a terrible average indeed.

32. The effects of *excessive inundation*, whether resulting from the annual rise of rivers or from unusual storm-waves, are believed to be intimately associated with bad "fever-years." The truth seems to be that inundations act in two different ways, or rather that their results are different according to the degree to which they occur. There is no doubt that a certain amount of periodical inundation, from flowing rivers, over cultivated lands, is, by the natives of Bengal, regarded most favorably, and not without reason. The *alluvium* borne along by the flood-waters, when deposited on the fields, greatly adds to their fertility, and from the want of such inundation lands often deteriorate. Yet when floods are excessive, or when uncontrollable irruptions of the sea occur vast marshes are apt to be created, which, when they are undergoing the drying process, present a favorable field for the development of fever. Thus on the exact degree of inundation seems to depend the benefit or harm which results to human life and interests. At Rome a destructive fever followed the inundation of the Tibur in 1695. In Holland the worst fever seasons have corresponded with casual incursions of the sea. The malarious season in Egypt commences with the subsidence of the Nile. In and near Calcutta itself, the inundation of the 20th and 21st May 1833 was followed, at the end of August of the same year, by a most calamitous fever which carried off thousands (Martin). The period of subsidence and drying of the Brahmapootra and Gangetic floods is the most unhealthy season of the year; yet it cannot, I think, be denied that a certain degree of inundation has a purifying, oxygenating effect, whilst the total absence of such inundation not unfrequently results in great local unhealthiness. The great sickness which recently occurred at *Jehanabad* was due to alterations of this kind.

33. Some have thought that the density of *jungle* and of *rank vegetation*, in and around Bengal villages, so vitiate the atmosphere and impedes its due circulation as to warrant its being regarded as one of the chief causes of the great fever-visitations. This opinion has been met by the statements not easily controverted that the prevalence of the disease and the density of jungle are not invariably proportionate; that the affected districts now, as compared with former years, do not present an unusual amount of vegetation; and that many parts of the country have been and are densely overgrown with under-bush where the villagers have not been affected with fever to an excessive degree.

The eager proposals for wholesale jungle-clearing which were at one time in the ascendant have fortunately either been set aside or accepted only in part. The destruction of plantain groves and of other fruit trees was a measure ill-considered and unnecessary, and I have myself seen brushwood indiscriminately cut down by order (but not up-rooted) lying dead and decomposing on the ground, giving rise to the very evils it was intended to avert; and yet, although living foliage may, as a rule, be left undisturbed, it must be confessed that in some villages belts of bamboos are allowed to grow so compactly as seriously to obstruct the free circulation of air. Moreover, the bamboo sheds a vast quantity of dead leaves which are, for the most part, allowed to carpet the ground and ultimately to rot where they fall. This might easily be avoided. I would therefore recommend that villagers should be urged systematically to collect dead leaves and to burn them, which in some places they do in their lime-kilns. Whenever clearances are made cultivation should immediately follow. Lastly, without for a moment pleading that vegetation and fever must invariably be viewed as cause and effect, it may be said that there are some localities where considerable thinning of surrounding belts of bamboo, screw-pine (*Pandanus odoratissimus*) or other low jungle would be advantageous. I might mention, in point, the villages of *Chakpore*, *Kishtonuggur*, *Kenkracooloe*, *Colerinee*, *Gungasuggur*, &c. In such places the *jatropha*, *asclepias*, wild aloe, screw-pine,

"ghintoo," and "shial-kanta" are allowed to grow too densely. All shrubs and trees, however, (such as the banyan, peepul, plantain, palm, jack, tamarind, acacia, &c., &c.) may well be left alone. To destroy any of these would be most undesirable, and quite irreconcilable with the experiences of the people of the country.

84. It is worthy of careful consideration how far *defective conservancy* and *general insanitation* are to be regarded as causes of fever. Some are of opinion that there exists no relation whatever between them. Indeed it has been repeatedly said that the fever is known to have prevailed but slightly in some of the oldest, dirtiest, and most neglected villages, whilst it has severely affected others which were in a comparatively clean and well-kept condition. Although this may have been the case in some instances, I must say the above statement does not tally with my general experience. I am strongly inclined to think that the examples were somewhat exceptional in which dirt and neglect combined were not associated with insalubrity, although they may not always have been in exact and unvarying relation to each other. I do not mean to assert that filthy conditions of themselves will always produce intermittent fever; on the contrary I know they will not do so. But where, besides mere rubbish and dirt, we observe general neglect and general insanitation; where the atmosphere is close and vitiated; where water is stagnant and foul; where surface-cleansing is neglected, and decaying organic matter is found in abundance, we may very generally calculate upon finding sickness; and, more than this, the special ravages of disease will, in most instances, be found to correspond with a more than usual accumulation of obvious localizing causes.

I do not say that the accumulation of house refuse is of necessity a source of malarious disease, nor that excrementitious matter is capable under all circumstances of generating pestilence. It is certainly not so. But that at certain times and under certain conditions the presence of such elements favors, if it does not actually cause insalubrity, is most certain. We further well know that heat and moisture, re-acting on each other, may afford an atmosphere most suitable for the production of disease. What then can we think of all the filth and vegetable decay of Bengal villages but that it is a source of danger, and that it ought to be removed, and treated in such a manner as experience teaches to be most safe?

85. I now come to what I believe to be the most important of all the causes of so-called malarious fever, viz., *insufficient drainage, the partial or complete obliteration of rivers, and the pernicious states of soil, air and water* which are thereby produced.

All the causes above discussed stand for little as compared with this. Engineer Officers who have given any attention to the subject are, I believe, all prepared at once to allow that the drainage of the Hooghly district is now very imperfect. On this point I need only refer to the reports of Mr. Isaac, Mr. Leonard, Colonel Nicolls, Captain Garnault, and Mr. Adley. Some years ago, Captain D. Landon, R.E., found that the *Baly* and other *khdls* had silted up so much as to impede the natural outflow of water from the interior of the country. They have continued to do so ever since. It is my impression and belief that serious obstructions to drainage are to be found chiefly in the vicinity of places which are or have been notoriously unhealthy. The complete closing, by a *band*, of the old bed of the Damoodah at *Halara*—close to *Selimabad*—has converted the *Koontes nuddes* into a dead river. The strong embankment all down the course of the Damoodah on its left bank has had the effect intended of preventing any flood-waters from passing into the district in an easterly direction. In consequence, to a considerable degree, of these works the rivers and *khdls* throughout the district have been steadily silting up. They have also, at many parts, been further obstructed by throwing weirs or dams across them for local irrigation, fisheries, or the like,—converting the old reaches of the river into a series of pools. The beds of all the water-courses are thus being gradually elevated or "honey-combed"; even rain-water is unable to flow any distance, and the usual picture, under such circumstances, is, as might be expected, extreme uncleanness of soil where formerly broad and deep streams flowed.

The question as to the necessity—for the safety of the railway—of the absolutely effectual and complete *banding* of all the Damoodah waters rests with Engineer Officers. Regarding the matter merely from a sanitary point of view, I am bound to say that, as far as the health of the district goes (setting all other considerations aside), it would have been much better if a portion at least of the Damoodah waters could have been allowed still to pass in an easterly direction. Indeed, I believe, that if the quantity of flood-water which now annually inundates and injures the country lying on the *right* bank of the river could still be made to pass to the eastward that there would be a great gain to public health. Whether this could be accomplished by partial openings in the embankments, flood-gates, and the like is an engineering question, upon which I cannot pretend to offer an opinion of any value. To a non-professional eye, however, there seems to be no insuperable difficulty to this; and I can only repeat that for want of fresh water, want of "scour," and want of due "oxygenation," the Hooghly district seems to me very much in the same condition as is a man who, being strangled, must either very soon obtain more oxygen, or—after a struggle—die asphyxiated. The silting of river-beds, such as is occurring on so large a scale throughout the Hooghly district, is, I believe, the first of a series of changes which, by natural sequence and law, lead on to the deterioration of localities, the defilement of water-supply, and the generation of the most deadly tropical diseases. Indeed the study of such conditions embraces the most important view of the cause of the variations in public health.

The mode in which the silting action of rivers in alluvial tracts goes on has been carefully observed by men of science;—with relation to the Ganges by Mr. James Fergusson, (*Quarterly Journal of the Geological Society of London*, Vol. XIX.); to the Nile by Sir Gardner Wilkinson, (*Journal of the Royal Geographical Society*, Vol. XX.); and to the Mississippi by Sir Charles Lyell; but the bearings of this great subject to medicine have never yet been sufficiently studied. On the "régime" and varying phenomena of Indian rivers, however, (particularly on their drying and disappearance) greatly depends the health of the people of Bengal. Given a stagnant, foul, shallow, it may be half-dried water-way, one may generally expect to find in the persons of those residing near it the distinctive *cachexia loci* (implying debility, sickness, spleen disease, and short life.) Further, as water-courses become raised, their outlets silt up and become altogether or comparatively impracticable for drainage purposes, particularly if sand-islands (*churs*) happen to form in the stream towards which they pass, as has happened in the case of the *Koontee* and *Shursuttee* at *Noasserai* and *Trebani*, and for a long distance down the Hooghly. Such are, in my opinion, the exciting causes of the unhealthy ground-conditions upon which, *primarily*, the fever of the Hooghly district depends. The origin of the evil is obstruction to drainage, the drying of an impure, moist, un-aerated surface soil, and defilement of drinking water. Where such conditions obtain, the air cannot be pure. An ancient medical writer tersely enunciated this truth in the following words:—"Ubi bonæ sunt aquæ, ibi bonus—ubi malæ malus itidem est aer."

The precise manner in which the unhealthy influence is generated and takes effect is yet unknown. But it is probable that the evaporation of ground moisture, leading to depression of temperature, which again alternates with intense heat, creates those extreme variations in the state of the atmosphere which are always apt to prove injurious to man. Whether, above and beyond this, there is any specific noxious element or property of matter in action remains still undetermined. The most important fact to remember is that the remedy lies in effectual drainage, and in the opening out either of dead rivers or of new channels of outflow. The experience of many countries has established this beyond all dispute, and it has frequently been observed that diminution of malarious disease has "kept pace with the improvement of wet lands." We have it on the authority of Hippocrates that when the marshes near *Abydos* were drained, the place became healthy. The population of *Chatillon*, in Burgundy, became doubled, within thirty years, after it was drained (*Macculloch*). The country adjoining the city of Philadelphia passed through a similar change. At one time a great morass, it filled the Pennsylvania hospital with cases of fever and dropsy. The land was reclaimed, and it soon became a scene of remarkable prosperity and happiness—(*Caldwell's Prize Essay on Malaria*, American Journal, Vol. VIII.)

36. At present the channels of the *Kana* and *Koontee Nuddes* present many miles of damp, naked ground, and a series of shallow pools of most impure water. They are merely broad ditches, the sides of which are greatly polluted both with vegetable and animal decomposition. The *Shursuttee nuddes* is in very much the same condition, although perhaps not so defiled as the *Koontee*. The *Gheeu Nuddes*, on the other hand, which has not been closed, and through which there is still a natural, although not a very great flow, presents a pleasing contrast to the dead rivers named. Indeed from the point at which the *Koontee* and *Gheeu* unite many of the abominations which characterize the dry channel are lost sight of, and a distinct increase of salubrity is observable.

37. I desire carefully to avoid anything like hasty or unsound generalizations, yet I think it cannot reasonably be disputed that there does, in very many instances, exist a general relation between the extreme unhealthiness of places and the proximity of old river channels in a half-dry, filthy state. With very many of the Natives themselves, it is a commonly accepted opinion that the immediate vicinity of obliterated water-ways coincides with the severest manifestations of disease, whilst at the distance of two or three miles from such half-dried channels, the rates of sickness and mortality manifestly decrease. I do not mean dogmatically to assert that the unhealthiness of every place in the district is to be accounted for in this manner; very far from it. Yet the correspondence between more than usual sickness and the proximity of a half-dry, slimy river-bed, is much too often observable to permit of its being passed over in silence. It is a matter of history that the ravages of fever which occurred at *Cosim bazaar*, some sixty years ago, were coincident with an alteration in the course of the river Hooghly; a similar fact has often been noted with reference to ancient *Gour*. The variations of public health at *Purneah* and other places, in past times, were, I believe, attributable to like causes. The Fever Commission of 1864 did not fail to draw attention (*para. 34*) to the fact that in past years, great sickness and mortality was observed to occur in the low, ill-ventilated villages lying along particular *nullahs*, such as the *Baeng nuddes*, the upper *Nobogunga*, the *Boyrub*, and the *Chitra*. In European countries the same thing has often been observed. The history of the British army in the plains of *Estremadura* affords a striking instance in point. I take the liberty of quoting the facts, which very closely bear on my present argument. "The country," writes Sir Thomas Watson, (Vol. I., p. 756,) "was so arid and dry for want of rain, that the Guadiana itself, and all the smaller streams had in fact *ceased to be streams*, and were no more than lines of detached pools in the courses that had formerly been rivers. The troops there suffered from remittent fever of such destructive malignity, that the enemy, and all Europe, believed that the British host was extirpated." It has been said of malaria that "it loves the banks of rivers, the borders of marshes, and the edges of stagnant pools."

38. On the whole I am inclined to think that the majority of the places which have suffered most severely from the prevailing fever in the Hooghly district are situated either near old half-dried river beds, or in positions where localized obstructions to drainage are without difficulty to be detected.

39. Some perhaps might be inclined to say, as I myself was at one time, that *Pundooah* and *Dwarbakhinee*, where terrible mortality occurred, have not the necessary conditions near them. But, on close enquiry, this will be found not to be the case,—great obstruction to drainage having occurred at both places, and each of them being situated close to the almost obliterated channel of what must once have been a good-sized river. The *Kossye* and *Kedar-muttee nuddees* are now almost unknown even at the places through which they formerly passed, yet their outline is to be traced, corresponding to deep interrupted ditches, in close proximity to which fever prevailed with great severity.

40. Those who desire to see characteristic pestilential spots, situated close to stag-

Parambo, Shahbazaar, Shampore, Joynuggur, Pooriarpora, Tongra, Balghur, Konkracoolce, Chandbattee, Deepay, Govindpora, Goleahet, Dinglehattee, Juggenathpora, Poohpara, Porshudpora, Chakpora, Shabbhopore, Jotemadub, Bailya, Adjudia, Khaupore.

nant Indian rivers, (which have not inappropriately been termed "the last receptacles of all that has ceased to live,") should visit any of the places noted in the margin.

41. All these localities have been the scenes of terrible degeneration; and the accumulation of insalubrious conditions around them even now urgently demands attention. I beg anxiously to bring this to the notice of the Government.

42. The river-bed adjoining all those places is half-dry and choked with decaying vegetation; the ground towards the edges is poachy and damp; sluggish, stagnant pools appear in lines; the banks are not only defiled with ordure, but the burning of bodies is practised all along its limits. Such cremation is in many cases only partial, and it is very commonly conducted close to foot-paths; human bones lie scattered along the line of the river; the cloths and rags with which the dead were covered remain undestroyed; and the amount of past mortality can be estimated with tolerable accuracy by the number of the earthen vessels (*kutsees*) which strew the ground, and which at the time of the funeral ceremony contained the water with which the fire was extinguished.

The Koontee or Kana nuddees (as the case may be), near the places abovenamed, are in a most objectionable state and much require clearing. At sunset, a heavy, foggy, stagnant and oppressive atmosphere pervades such localities, and a most nauseous putrescent smell is evolved from the ground around. It is scarcely to be wondered at that death should revel at such infamous spots, where so many potent causes of disease are present and in actual operation before our eyes.

43. I am of opinion that the villagers, and the landowners particularly, should be compelled to prevent the inexcusable defilement of the river banks which now goes on. With regard to cremation, much neglect occurs which might easily be obviated. The people are strangely and culpably indifferent in this respect. The localities where I was most strongly impressed with this thought were the following:—

(a.) At *Deepay*, where there was "a place of skulls."
(b.) In front of *Betroghur*, and between *Paratol* and *Bahadoorpore*, where the same holds good.

(c.) Also at *Moondleekia*; between *Gopenathpora* and *Morrah*; and at *Gojja*.

(d.) At *Polimpore*, where a number of skulls of human beings and of cattle were scattered about together.

(e.) At *Juggubulubpore* where, in different directions, bodies are burnt within a few yards of high-ways; and where I observed 30 or 40 new Mahomedan graves close to the side of the road which leads to *Amptah*.

(f.) Between *Parambo* and *Shahbazaar* (about half-way on the left bank of the nuddee) where more than a dozen skulls were seen close to the path, and where cremation is had recourse to almost on the *kutchra* road.

(g.) In front of the village of *Robecrampora* (near *Parambo*) where I counted, on one field, upwards of 80 skulls, and where dogs and jackals were seen prowling about, in day-light, amongst the bones—a most revolting and saddening sight.

44. I have said that I think there is generally more healthiness away from dead rivers than near them. Thus I was informed at *Adjudia* that the places to the eastward away from the old nuddee—(more than two miles)—which are not so sickly as those on its banks, are the following:—*Jojoor*, *Gujni*, *Chitrcal*, *Akpara*, *Madra*, *Mogulpore*, *Noinuggur*, *Oilipoor*.

Similarly, at *Gopenathpora*, I was informed that "all the villages near the nuddee are unhealthy; but if you go to places a mile and a half on either side of the river, they are comparatively little affected. Passing, however, more to the east, one comes near the *Bundee-pore* river, and close to it again you will find sickness."

Again, at *Poohpara* I was told: "On both sides of the nuddee great sickness prevails; on going one mile to the east or west it will generally be found to decrease."

In the jurisdiction of *Juguthulubpore* the same fact was reported to me, viz., "places not immediately on the nuddee suffered least." Again, the same information was repeated at *Moondleekia*. At *Aoorbattee* the remark was volunteered by the villagers that sickness was distinctly more prevalent in the immediate vicinity of the old nuddee (as at *Tora* and other

places). Again, at *Poorcarpore* the people said, the villages which have been affected comparatively lightly, and which are situated at the distance of a mile or more from the muddies, are:—*Ramnuggur, Ekidaloo, Brahminpara, Dultoopoor, Keengkata.*

Many similar illustrations of the same fact might be cited, but it seems unnecessary to add to the above list.

45. Having remarked on various opinions regarding the cause of the fever, I pass on to the consideration of what was recommended last year;—of what has since then been effected;—and of what is still most urgently required in the district.

In my last report on this subject I particularly dwelt on the necessity for an *engineering survey of the district*, and for the introduction of an organized system of *medical relief*. I am glad to say much has been done in both these directions; in some respects much more than was recommended. On the whole the medical relief afforded by Government has certainly been the means of saving hundreds of lives; and the engineering observations and proposals already made are now leading on to more comprehensive considerations, the complete and successful fulfilment of which I hope nothing may be allowed to hinder.

46. Mr. C. Adley, C.E., was appointed by the Government to determine “whether want of drainage had caused or intensified the prevailing fever;” and, if so, how it could be rectified, and at what cost. He was also directed to report on the old *khâls* and rivers, and to show to what extent silting had occurred in their channels, &c., &c. Mr. Adley’s reports of the 25th June and 10th September 1869 are with the Government, and the result of his observations and enquiries have been carefully shown on a well-executed chart. Of these reports and map I presume to make the following remarks: They are very useful and contain much valuable information; and, from my enquiries, I should say that the fever chart of the district, so far as it goes, is generally trustworthy. I have myself, however, preferred to illustrate the prevalence of the disease in a different manner from that adopted by Mr. Adley—giving, in color, a distinct indication of the past condition of each place visited, instead of trying to depict the subject in a more general way, by shading, the result of which is perhaps less precise than that arrived at by the other method.

The most important conclusions come to by Mr. Adley, (bearing on public health) appear to be the following: that the district *does* stand much in need of drainage; that this fact in a great measure represents the cause of the fever-scurge; that the rivers and *khâls* of the country observed *have* seriously silted and deteriorated; that, in an engineering point of view, there is no difficulty about the drainage question; and that, if properly conducted, the necessary measures ought to be largely remunerative. Estimates, schemes, and the prospects of very favorable results have been submitted by Mr. Adley. He recommends the reclamation of the *Dancoonee, Kathlia, and Roypore* swamps; deepening of the *khâls* and improvement of their embouchures; re-opening of the Kana Damoodah at *Solimabad*; the adoption, throughout the district, of “high and low level drains to serve the treble purpose of drainage, irrigation, and navigation”; and the introduction of general sanitary measures.

I confess that so far as I am able to form a judgment on the subject, Mr. Adley’s suggestions appear to me very practically useful and quite to the point.

47. With regard to the subject of medical relief for the district, I last year recommended the establishment of four or five dispensaries; but I am happy to say that Dr. Thompson, the civil surgeon of Hooghly, reports that no less than fourteen dispensaries have been in successful operation during the year. As many as 48,274 patients* obtained gratuitous medical aid at these establishments, the total cost amounting to about Rs. 7,000. Dr. Thompson writes on the subject as follows:—“It was ascertained and is well-known that much good was thus effected among the people, many of whom are now endeavouring to raise monthly subscriptions for the purpose of establishing permanent dispensaries in their respective localities.”

48. Last year I had occasion to suggest to the Government that a few good and simple European medicines might advantageously be placed within the reach of the people of Bengal at English cost price. I am glad to think that this proposal has been approved by the Government, and referred to all Commissioners of Divisions, and to the Inspector-General of Hospitals Indian Medical Department.

The only disadvantage, connected with such an arrangement, that I can foresee is the possibility of its interfering with the fair profits of Native doctors who now sell drugs on their own account. Some of them charge exorbitantly for their drugs, but all do not do so. Care should, I think, be taken that the new rule shall not be hard upon those practitioners. For the better working of the plan I would presume to suggest (and I do this after consultation on the subject with a good many Native gentlemen) that the sale of all medicines in the manner referred to might be conducted under the conjoint supervision of village *punchayets*, consisting of *Zemindars* *Gomasthas* and of other respectable men of local influence willing to devote a little attention and trouble to the subject. I hope this proposal may soon be carried into effect, without detriment to the interests of independent practitioners. The advantage to the people of their being able to purchase at any time good English medicines, at reasonable rates, must be very great.

There is no doubt that they now fully recognize the efficiency of European remedies. The Native doctors who practise in the district on their own account systematically prescribe them,

* Note.—Of these 30,819 were Hindoos and 17,458 Mahomedans. There were 23,794 cases of chronic fever, and 8,021 recent cases. The remaining 11,000 persons were suffering from other diseases.

as do also some even of the old kobirajes. At one place I saw a Baboo whose sole occupation, as he himself told me, was to sell quinine mixture; he was not a doctor.

A pundit at Jumalpoore has acquired great reputation amongst the people. They go long distances to him. His skill is widely acknowledged. Some of the villagers at Bahadoorpore were loud in his praise; they showed me many patients who had been successfully treated by him; I asked to see the remedies they had been taking, and found them to consist of genuine quinine and fever mixtures of good quality.

In some instances the villagers are very much afraid of taking quinine. They told me they had heard it was very apt to cause deafness, blindness, and even worse maladies. I tried to set them right on this point, and to disabuse their minds of an exaggerated error, upon which they frankly acknowledged that in some cases, a continuous and persevering use of the remedy had proved perfectly effectual. The origin of the false impression is probably to be accounted for by the fact that some of the kobirajes, who possess little of the expensive drug, persuade the simple people that its highest virtues appear when it is administered cautiously and in very small quantity. As a rule, however, kobirajes and their modes of treatment are not now in general request.

I saw one remarkable instance to the contrary at the village of Adjudia on the Koontee nuddee. A kobiraj is there (named Modoo Roy) who is well-known amongst the people, even at long distances. He administers no medicines, but practises a peculiar mode of counter-irritation over the spleen, for the cure of fever. I happened to go to the village on one of his operating days, and I found him busily at work with a large concourse of sick people round him—not fewer than 200. He did not at all object to my seeing what he was doing; on the contrary he invited me to sit near his patients whilst he went through his little operation. He believes that in three years he has operated on at least 20,000 persons with enlarged spleen. He placed in my hands portions of the shrub from which his blistering substance is prepared. Nobody present could tell me the name of the plant in Bengali; but some of the ryots said that it was popularly known as "*Hengchootee*"—"make-sneeze" on account of its irritating properties when brought near the nostrils. I afterwards frequently saw it growing in the rice-fields; indeed it is a common Indian weed, and I am informed by my friend Dr. John Anderson, Curator of the Indian Museum, that it is *Ameletia Indica*, DC.—Nat. Ord. *Lythraceae*. It is simply bruised, with a little water, between two rounded stones, and a paste made. This is spread on little strips of *Shurr* leaf, two or three inches in length. A little oil is applied over the side, in narrow lines—usually three parallel ones (sometimes others are drawn at angles). On these oil marks, which are over the enlarged spleen, the blistering substance, spread on the strips of leaf, is applied. Usually within two hours—sometimes much sooner—a blistered surface has been produced. I saw many persons in whose case the operation seemed to have diminished the splenic enlargement. No other kobirajes use this remedy, the virtues of which, according to Modoo Roy's statements, were directly communicated to him by Kali in a vision! He operates only on one day in the week, and never takes any money from the sick, regarding it as his particular mission to heal the poor with his simple remedy. I have thought it worth while to mention this case, even though it merely illustrates the practise of a simple village doctor. At least the fact seems worthy of enquiry whether in the rice-fields of Bengal a counter-irritant remedy is readily to be found, the useful properties of which do not seem to have been very generally recognized.

49. It only remains for me to consider what practical measures are most worthy of attention in the future, with reference to the improvement of the sanitary condition of the Hooghly district.

(a.) The surveys necessary for carrying into effect a complete drainage scheme are still in progress. They should be completed with the least possible delay.

(b.) It ought, as soon as possible, to be determined by competent Engineer Officers whether the present dead rivers can again be opened out, deepened, and rendered effective as natural drainage channels, or whether new courses for drainage must be looked for and rendered practicable.

If I am not mistaken, certain differences of opinion still exist on this point. A definite decision should be come to and acted on.

(c.) The condition of the Kana, Koontee, and Shursuttee nuddees especially deserves attention. If by deepening they can be rendered useful, there will be a great gain to the people. Failing this, they should not be allowed to remain in their present state. I regard it as a *conditio sine qua non* for public health in the district that the present faulty ground conditions (described in paragraph 42) should be rectified.

(d.) The particular question as to the possibility and expediency, or otherwise, of letting water into the district through regulating sluices in the bund at Halara, near Selimabad, should be anxiously considered and definitely settled once for all.

(e.) If the old river-beds are to be regarded as effete, and necessarily to be abandoned, cultivation should be encouraged along their course, and they should be "warped up."

(f.) Not only should more water be let into the district, but its complete control and removal should be provided for. Efficient drainage will, in itself, ensure this.

(g.) The drainage scheme now in contemplation should have careful reference to the levels of any irrigating channels likely to be hereafter made throughout the district.

Drainage, without ample drainage, is most injurious to public health. This should be accepted as one of the axioms of sanitary science.

(k.) All *kāds*, such as those of *Baly*, *Bydeballee*, *Mugra*, &c., should be deepened, particularly in the direction of their out-falls.

(l.) The encroachments due to the formation of *chars* or sand-islands near the mouths of drainage outlets should be carefully watched, and, if possible, prevented.

(j.) The construction of dams or *jweirs* across water-ways should be strictly prohibited under severe penalties.

(k.) The *Dancoonee*, *Kathlia*, *Royfote*, and all other large swamps should be reclaimed. This has been pronounced by engineers to be not only feasible but easy. Reclamation should as soon as possible be followed by cultivation. Want of money being the chief hindrance at present, it is to be hoped that all those landowners who are likely to benefit by such works may readily consent to fair assessment. Thus, and thus alone, will they be able to point to "improved estates and a rescued tenantry."

(l.) Side-cuttings along roads or railroads should either, by continuous extension of the excavations, be converted into lines of drainage, or they should be systematically deepened and so converted into reservoirs of clean water.

(m.) Meteorological observations ought to be collected with more than usual care in those parts of the country where fever most prevails. I regard this as a matter of very great importance indeed. At present, except at Sudder stations, nothing is done in this respect. Wherever fever prevails with unusual severity, a skilled meteorological recorder should be deputed to take observations of a comprehensive and minute character. Without this, the most necessary information regarding the conditions favoring the appearance of fever will be wanting.

50. In addition to the above recommendations, it is beyond question that to redeem the country from the influence of fatal pestilences, a general sanitary system must, sooner or later, be introduced. To remedy existing defects in this respect appears to me one of the chief wants of India at the present time. The exertions not only of the medical profession, but particularly of landowners should anxiously and continually be directed towards the prevention of disease, and this can only be effectually secured by the introduction of measures of a simple nature, but corresponding to the extent of the evil which they are capable of obviating. I would not for a moment depreciate efficacious treatment by medical means, but the fact can never safely be overlooked that so long as the country is undrained and uncleansed so long is danger bred at every door. I think it is now quite worthy of consideration by the Government whether a general Sanitary Act should not be introduced throughout the Lower Provinces of India. Such calamities as the Hooghly fever are the results of preventible causes. Further, the amount of sickness, and the loss of labor and of life caused, in the districts of Bengal, by the want of pure air, good water, and simple conservancy, is incalculable. Well-judged sanitary regulations present us with the most certain remedy, the effect of which is to promote the prosperity of the country, and to ensure benefits in which all can participate. I am well aware that there are difficulties to be overcome, and prejudices to be encountered, and I desire to be most cautious indeed in recommending the introduction of public decrees of doubtful utility; but looking to the fearful results of independent action—or rather inaction—in matters of health, to the perfect possibility of averting them, and to the signal benefits attending judicious sanitary control, I am bound to repeat that I think the time has come when the Government might well consider the question whether public health, in the districts of Bengal, should not be more effectually guarded by the introduction of new sanitary regulations.

If every village had at least one good tank, if noxious and stagnant pools were nowhere to be found near human habitations, if nuisances were prohibited as they are in other countries, if the disposal of the dead was conducted with more care, we should, I believe, hear but little of devastating epidemics, and it would be found cheaper to keep the country in a healthy condition than to have it as it is now. I feel strongly that it would be quite justifiable and wise on the part of the Government to enforce greater strictness in sanitary matters than at present obtains throughout the Bengal districts, and amongst others in Zillah Hooghly.

51. I have alluded above to the subject of the proper disposal of the dead, and in paragraph 43. the names of places are given where this important matter seems to be neglected. A few special remarks on this subject appear called for:—

The rule should be strictly enforced that all human remains shall be either completely destroyed by fire or buried to a depth of at least four or five feet, and that no fragment, however small and detached, of a human corpse shall be permitted to lie exposed on the surface of the ground. I trust that the Government will insist upon this rule being strictly attended to in future. In hard times the very poor neither burn nor bury the bodies of the dead, but merely cast them forth in the open. I have myself on several occasions witnessed the terrible spectacle of dogs and jackals tearing human remains. Neither sepulture nor cremation—which is too often only partial,—should be permitted in the dry bed of any river, as now frequently happens. On the recurrence of the rains, impurities most dangerous to life are thus apt to

be disseminated. All skulls, whether recently disinterred by beasts of prey, or whether they have been for long exposed in consequence of insufficient cremation, should be disposed of in a proper manner; and I think that land-owners might fairly be held responsible that this is done in all cases. In whatever manner existing abuses may be rectified, I feel that it is quite sufficient to have mentioned the above facts, and to have drawn attention to the faulty arrangements complained of, to lead to their speedy correction.

52. Before concluding this report, I desire to add a few words regarding *Malaria* itself.

The fact that we are still altogether ignorant of the chemical and physical properties of malaria, not only constitutes one of the chief *opprobria* of modern Medical science, but it greatly impedes the prevention of a vast amount of human suffering. I cannot refrain from recommending the Government of Bengal to appoint a special Commission entirely to investigate this most important subject.

I am quite aware that there are not wanting those who would be likely, *primâ facie*, to scout any such proposal as this. The problem of the origin and nature of malaria has indeed often been worked at, and as yet always in vain. I have a knowledge of many of the experiments which have at different times been made on the subject,—by Orfila, Galloni, Déseve, Moscati, Vanquelin, Rigaud, Thénard, Boussingault, Daniel, Metcalfe, Blakewell, Condy, Odling, Dr. Angus Smith, &c., &c., ("it is unnecessary to assign to each his gas and his theory") and I fully allow that the most anxious investigations of those observers have not advanced the science of the day, as far as the nature of malaria is concerned; and yet it cannot truly be said that the inquiry has ever been taken up in that comprehensive spirit or carried out with that persistency and patience which so difficult a subject requires. Mere laboratory experiments must prove altogether insufficient. Scientific men should go to malarious localities, and work there until definite and useful results are arrived at. In no country in the world could this be more easily done than in India. A combination of talent (of analysts, physicists, and pathologists) should be brought to bear on the subject, and their work should not cease short of the acquisition of knowledge beyond what we now possess.

Close and continued investigations are much required on such subjects as the following:—

- (a) The distinctive physical characters of fever localities.
- (b) The electrical states of the soil, of the air, and of the human body.
- (c) The quality and chemical composition of water.
- (d) The careful analysis of marsh vapours, and of aerial impurities generally.
- (e) Their action on the human system, and particularly on the blood.
- (f) The microscopical examination of soils, and of the cryptogamic vegetation of swamps.
- (g) The precise relation of fever to temperature, moisture, evaporation, elevation, barometric pressure, and to animal and vegetable decay. In a word, all the immediate chemico-physical conditions under which malarious disease is developed should be analyzed, and if possible, the particular exciting agent should be brought to light.

The great advances which have of late years been made in the subjects of *Animal chemistry* and *Thermo-electricity* might be found useful in this inquiry; and if, as some believe, malaria be an inorganic poison, it is even possible that the recent researches and discoveries in *Spectrum analysis* might here be usefully applied,—a branch of science which has already thrown light on the action of certain poisons on the blood. It is full time that our great ignorance on this vitally important subject of malaria should be diminished, and that we should be able to determine whether we have to do with a *materia morbi*, with miasms, with specific organic germs, with *fungi*, ferments, mere electrical states, or what else,—setting for ever aside such vague terms as "occult epidemic influences," "general cosmical laws," "obscure terrene causes," and the like. The continued use of such ill-defined expressions only acts as a great barrier to the advance of science. I fear that even now we are as far from the mark regarding malaria as when the ancient Greeks wrote of *to thion*, nor are we a whit better informed as to the precise conditions under which malarious disease is evolved or gains strength. Leading authorities hold altogether different opinions on the subject, which only proves that it has heretofore been most insufficiently gone into. Disheartened, men of science hold back. And yet this fell disease, fever, devastates the world:—the same enemy which destroyed the British troops at Walcheren; which made Hungary "the grave of armies;" which poisoned and desolated the Tuscan Maremma; which "in the unhealthy parts of Italy, Sicily, and Greece, has accounted for two-thirds of the total mortality;" which in the Hooghly district, within the last eight years, has caused the loss of many thousands of lives; which still, year by year, necessitates so much invaliding in the British army; and which, by one of the leaders of the medical profession, has been spoken of as "the bane and scourge of a large portion of the world." Viewing the fearful destruction caused by this single influence, I cannot help thinking that extended inquiry regarding it is most necessary, and that a subject so momentous should be taken up more determinedly and deeply than has ever yet been the case in India or elsewhere. I only hope that the suggestion may be considered and approved by the Government, and that a special Commission may be appointed, persistently to inquire into the subject of Malaria, which at the present time is undoubtedly the greatest source of physical suffering in this country—the most destructive enemy that India has ever had to contend against.

List of places visited by the Sanitary Commissioner for Bengal between 9th February and 18th April 1870.

No.	Names of places.	No.	Names of places.	No.	Names of places.	No.	Names of places.
1	Burdwan.	76	Dhooliapore.	151	Morrah.	226	Harpore.
2	Mymaree.	77	Jehanabad.	152	Shamkapara.	227	Lokubatties.
3	Jumalpoore.	78	Bulrampore.	153	Chandipore.	228	Charagram.
4	Adampora.	79	Myapore.	154	Adungatchea.	229	Herrooa.
5	Konghra.	80	Protunpore.	155	Porelpore.	230	Dhoomroo.
6	Hariapore.	81	Serampore.	156	Pooriapore.	231	Basthora.
7	Boynah.	82	Paharpore.	157	Tengra.	232	Gooroop.
8	Beerampore.	83	Bashoorree.	158	Balgur.	233	Ramesurpore.
9	Narainpore.	84	Deputy-Coomarpoor.	159	Boidipore.	234	Jair Allasseer.
10	Mogra.	85	Horipaul.	160	Mirzapore.	235	Mohanad.
11	Deoripore.	86	Chowtera.	161	Tarissur.	236	Pundooah.
12	Shadeepore.	87	Dhoolia.	162	Shointea.	237	Hooghly.
13	Selimabad.	88	Narainpore.	163	Parumboo.	238	Pownan.
14	Rajarampore.	89	Shangapara.	164	Gungasnuggur.	239	Barole.
15	Shreekipore.	90	Khoonjobone.	165	Chenchoo.	240	Ponattigree.
16	Jote Sreeram.	91	Shampore.	166	Goolab bagh.	241	Oonchaye Polba.
17	Jote Dukkin.	92	Joynuggur.	167	Larada.	242	Sharanpore.
18	Jote Chand.	93	Ramnuggur.	168	Robeerampore.	243	Aina Gooshpore.
19	Paikparah.	94	Joyjeebunpore.	169	Shahbazar.	244	Soondershun.
20	Futtehpore.	95	Astera.	170	Dhusgurra.	245	Dautra.
21	Bora Boenan.	96	Ekdaloo.	171	Madhubpore.	246	Rooshool.
22	Modespore.	97	Duttoopoor.	172	Sourah.	247	Shackten.
23	Urzopoor.	98	Moozpoor.	173	Kulua.	248	Digunghurree.
24	Mohunpore.	99	Doarhatta.	174	Halara.	249	Malpara.
25	Chuckdiggee.	100	Purbuteepore.	175	Betroghur.	250	Chawpala.
26	Autpara.	101	Quinkalla.	176	Solimabad.	251	Meerkooloo.
27	Jagram.	102	Ballyachooan.	177	Paratel.	252	Balthannah.
28	Gooriaghur.	103	Sonattigree.	178	Kanjadapoor.	253	Shenghur.
29	Moholla.	104	Jote Madub.	179	Bahadoorpore.	254	Hareet.
30	Attarpore.	105	Bailya.	180	Baldanga.	255	Balkooroo.
31	Gootan.	106	Adjadhia.	181	Khanpore.	256	Senat.
32	Moisan.	107	Kassipore.	182	Dhunneakallee.	257	Goolara.
33	Champadanga.	108	Nundrambateo.	183	Alla-pestay.	258	Talchessa.
34	Mokuntopore.	109	Sooltanpore.	184	Kouan.	259	Poenan.
35	Marrul.	110	Koneackpore.	185	Seruliah.	260	Degoonpur.
36	Rajhulaut.	111	Chandhattee.	186	Bonepore.	261	Shiektee.
37	Nohogram.	112	Panchatchia.	187	Ganesh shampore.	262	Naghur.
38	Dogatchea.	113	Gopeenathpore.	188	Kunulpore.	263	Hour.
39	Soareh.	114	Kadhanuggur.	189	Polashee.	264	Dampore.
40	Jobnee.	115	Seerampore.	190	Dhamaitikkur.	265	Dwarbashingee.
41	Puspore.	116	Kishtonuggur.	191	Deolpara.	266	Dadpore.
42	Ninchuck.	117	Mohundbatee.	192	Kobulpore.	267	Jamipore.
43	Bojara.	118	Perhadpore.	193	Metepoor.	268	Hasnan.
44	Calcutta Bospore.	119	Shubblepore.	194	Koolul.	269	Bailmooree.
45	Amptah.	120	Dingelhattee.	195	Sooltanpore.	270	Mukkalpore.
46	Moshiraka.	121	Govindpore.	196	Kuckrakooloo.	271	Bagnon.
47	Bagnan.	122	Juggenathpore.	197	Jote Kainah.	272	Mandorah.
48	Coela ghat.	123	Colesinee.	198	Sunnushpore.	273	Chailooah.
49	Marrooburiah.	124	Poobpara.	199	Hajipore.	274	Jinipore.
50	Raing.	125	Kowtuckpore.	200	Heydirampore.	275	Maiskerah.
51	Gopainuggur.	126	Byheragutrah.	201	Katgora.	276	Aukparah.
52	Sulkoora.	127	Chakpore.	202	Kashipore.	277	Chittresal.
53	Seerharra.	128	Kootipore.	203	Mahurrumpore.	278	Rajhullattee.
54	Kooltikree.	129	Seetapore.	204	Modoosoodunpore.	279	Jainabattee.
55	Mohunkally.	130	Echanuggur.	205	Malkipore.	280	Bundipore.
56	Gopeegunge.	131	Jagutbulubpore.	206	Mahmoodpore.	281	Koonkorbattee.
57	Kayput.	132	Mushra.	207	Sonraspore.	282	Naleecol.
58	Champur.	133	Ranehundee.	208	Alipore.	283	Boregatchia.
59	Mirzanaree.	134	Sherbutta.	209	Poyah.	284	Bhola.
60	Odgechuck.	135	Shanpore.	210	Mirzanuggur.	285	Kannarpore.
61	Bishtopore.	136	Dosa.	211	Booshooa.	286	Dowlutpore.
62	Ramnuggur.	137	Nundpore.	212	Oojeinee.	287	Dolweegatchee.
63	Budeepore.	138	Ryekali.	213	Molickpore.	288	Gopalauggur.
64	Ballighat.	139	Gwalpota.	214	Talhoona.	289	Kashaychuk.
65	Russetgunge.	140	Chandool.	215	Konweebanka.	290	Ghazeeepore.
66	Nimtallah.	141	Bakool.	216	Bhamunpara.	291	Chuk Gobind.
67	Koosputta.	142	Bally Deetpoor.	217	Joyrambattee.	292	Chunanco.
68	Ghatal.	143	Moondleeka.	218	Keshubpore.	293	Hoshalpoore.
69	Shreemuntopore.	144	Rajipore.	219	Dutipore.	294	Anundonuggur.
70	Seenuchacolee.	145	Bomenuggur.	220	Bunderhattee.	295	Boyyola.
71	Khongrah.	146	Anoorbattee.	221	Kagatchee.	296	Boincheepota.
72	Oodraspore.	147	Athpore.	222	Doorgaperahad.	297	Rajarattan.
73	Doorgumjoo.	148	Tora.	223	Goteepore.	298	Dobogatta.
74	Balce.	149	Gajja.	224	Kalkipore.	299	Karchee.
75	Shalypoor.	150	Panbutteepore.	225	Bindrampore.	300	Moheshiticree.

No.	Names of places.	No.	Names of places.	No.	Names of places.	No.	Names of places.
301	Joymohulla.	327	Shankrail.	352	Russeebpore.	378	Bonjnara.
302	Naziribajree.	328	Colebarria.	353	Polimpore.	379	Anuntopore.
303	Chughturwa.	329	Auloompore.	354	Dantchi.	380	Shunkerbattee.
304	Modunmohanpore.	330	Korola.	355	Doogorampore.	381	Ahmedabad.
305	Jampokree.	331	Notibpore.	356	Russoolpore.	382	Moishpore.
306	Bairabaree.	332	Odpoore.	357	Eentkally.	383	Juggenathpore.
307	Baijoomaillee.	333	Deolpoore.	358	Roostumpore.	384	Omerpore.
308	Singhoor.	334	Koshmarra.	359	Borai.	385	Rajhaut.
309	Jullinghatta.	335	Rajapoor Bheel.	360	Teeshay.	386	Maleompore.
310	Hindoopore.	336	Keshubpore.	361	Tejpoore.	387	Dorsila.
311	Chalkipati.	337	Kutorah.	362	Hurreedanga.	388	Shakorlapara.
312	Juggunuggur.	338	Howrah.	363	Korsorye.	389	Mailchee.
313	Madubpore.	339	Gotoo.	364	Dagumpore.	390	Kola.
314	Bakaba.	340	Narsainpara.	365	Munneerampore.	391	Mugra.
315	Jonye.	341	Dogatchia.	366	Shunkur.	392	Dhemra.
316	Chonditolla.	342	Dhoomoo.	367	Okordah.	393	Gopalpore.
317	Kaleepore.	343	Koosulpore.	368	Borah.	394	Beespara.
318	Mohunhaut.	344	Gancorlah.	369	Jenkari.	395	Noaserai.
319	Jugdishpore.	345	Dobogatta-Nayaba- errie.	370	Bailoo.	396	Chunderhattee.
320	Baskoor.	346	Chooterpore.	371	Nobogram.	397	Trebani.
321	Dofferpore.	347	Nanda.	372	Chatra.	398	Joypore-Bigattee.
322	Doimerpore.	348	Gomootee.	373	Hydebattce.	399	Shunglenuggur.
323	Jampoordah.	349	Hickrampore.	374	Chaudernuggur.	400	Shatgaon.
324	Doomjoor.	350	Aslowra.	375	Baileooly.	401	Kishenpore.
325	Gonenuggur.	351	Poorshuttumpore.	376	Nowpara.	402	Chunnundpore.
326	Andool.			377	Notibpore.	403	Dabanundpore.
						404	Kajeerdanga.

Correspondence relating to the collection of the Income Tax in the 24-Pergunnahs.

From D. J. McNEIL, Esq., Officiating Secretary to the Board of Revenue, Lower Provinces to the Officiating Secretary to the Government of Bengal, Revenue Department,—(No. 274B, dated Fort William, the 25th June 1870.)

I am directed by the Board of Revenue to submit, in original, a letter No. 51, dated 20th instant, from the commissioner of the Presidency division, reporting the result of an inquiry made, by him with reference to a letter in the *Daily News* of Saturday, the 11th idem, headed "Income Tax Oppressions," and signed by the Revd. G. Kerry.

2. The Board agree with the commissioner regarding the assessment of Dwarkanath Boyrager, and observe that this is one of the difficult cases in which all that is certain is that the assessee's income is not much over or under Rs. 500. Had the assessee objected and brought up his daily account book the truth would have been ascertained.

3. The Board concur with the commissioner in recommending that the fine imposed on Bhollay Dholil may be remitted and refunded to him, together with the cost of the stamp on his petition of objection.

4. I am to state that the Board agree entirely with the commissioner in reference to the remaining cases, regarding which his inquiry appears to have been complete and careful. The whole investigation shews that the assessor erred in overvaluing the means of the assesses, but it also proves careful inquiry on his part, more careful than is, the Board believe, made by the generality of assessors.

5. I am to add that the Board think it is to be regretted that without going himself to the spot, Mr. Kerry should have assumed that all the conclusions arrived at by the assessor, who did go there, were incorrect.

6. The return of the original enclosure is requested.

From H. A. COCKEBELL, Esq., Officiating Commissioner of the Presidency Division, to the Secretary to the Board of Revenue, Lower Provinces,—(No. 51, dated Calcutta, the 20th June 1870.)

HAVING seen a letter in the *Daily News* of Saturday, the 11th instant, headed "Income Tax Oppressions," and signed by the Reverend G. Kerry, a Baptist missionary in Entally, I at once wrote to that gentleman requesting that he would favor me with some further information regarding the cases he referred to, as I proposed holding a personal inquiry at which I should be glad if he would attend.

2. On the morning of Monday, the 13th instant I drove out and held an investigation in Singherate, which is a suburban village, distant about three miles from Kidderpore bridge. Mr. Kerry was present during the inquiry. My inquiries were especially directed to the cases mentioned in his letter, but I endeavoured, as far as I was able, to test the general fairness and propriety of the assessments made in the village. The result of my inquiries I now beg to submit to the Board.

I should mention that previous to our visit on the morning of the 13th, Mr. Kerry had not himself been to the village; the statements sent to the newspaper were founded on the complaints made to him by the villagers, the accuracy of which he had endeavoured to test to some extent by inquiries made through a native convert.

4. The first case mentioned is that of Kalachand Ghose, thus described by Mr. Kerry. "Kalachand Ghose is a journeyman carpenter, working for one of the Calcutta firms, and does particularly well if he earns Rs. 200 a year. He has paid Rs. 6, and has received a demand for Rs. 8 additional for last year." I visited the homestead of Kalachand Ghose, which consists of three cutcha houses surrounded by four beegahs of land which he rents. There is a small tank and a plot of plantain and other trees. In addition to this land, he rents three beegahs of land for paddy cultivation; he also possesses two cows. He is employed as a carpenter by the firm of Messrs. Mackintosh, Burn and Co. At this inquiry he most positively assured me that he was employed as a common carpenter, and that his earnings never exceeded Rs. 12 a month. I was inclined to credit his assurances, and to think the case a hard one, but being anxious to test the truth of the statement as far as possible, I sent to his employers, from whom I learn that instead of being a common journeyman carpenter, Kalachand mistree is "a carpenter mistree or headman;" that he has been in their employment since 1867; that he has in his employment some eight or ten men whose gross average earnings aggregate Rs. 105, of which they consider the mistree's net earnings would be from Rs. 20 to 25 a month. He was originally assessed in a higher class, but on objection being preferred his assessment was reduced, and he now has to pay Rs. 9.

5. The difficulty found in this case in getting at the truth is a fair instance of what assessors have to contend with. Though I was surrounded by his fellow villagers and questioned them, not one of them would tell the truth regarding this man's income and employment, though they must have been perfectly well aware that the statement that he was a common journeyman carpenter was entirely untrue. If I had not sent to his employers and obtained the information from them, I should never have discovered the truth. His employers have, I think, underestimated his net share of the gross profits which must be nearer Rs. 30 to 35 a month. I cannot say I consider Kalachand Mistree to have been improperly assessed.

6. The next case is that of Dwarknath Boyragee, described by Mr. Kerry as keeping a small mooder's shop, his sole means of livelihood, whose income may be estimated at Rs. 100 a year. I am not aware on what data Mr. Kerry founds his estimate. It is, I think, almost impossible for any European to estimate with any degree of accuracy the profits of a shop-keeper of this class, as they keep, or at any rate will produce no regular accounts. None of them keep large shops, and the amount of their income must entirely depend on the local custom they get. The assessor considered that the fairest way was to ascertain on any chance day what the day's earnings had been. Accordingly on the day he visited the village he went to the shop, and at his request the man produced the day's earnings from the till, which amounted to between Rs. 5 and 6. Of his gross receipts, a mooder is considered to make annas 4 in the rupee net profit, and on this basis the assessor made his calculation. The estimate, I admit, seems to me a high one. The assessor was informed, however, that this man likewise dealt in spices which is a very profitable branch of the trade. This is denied by his neighbours, and must be considered doubtful; but on the information he had received, and from the result of his own enquiries, I cannot say that I consider the assessor was wrong in serving Dwarknath Boyragee with a notice. Had he objected, a fuller inquiry would have been made, the result of which might have been favorable to him; but he neglected to do so, and the assessor had no option but to confirm his assessment, and subsequently, on his neglecting to pay, to prosecute him criminally before the magistrate. The assessee denies that any notice was served on him, but the magistrate must have been satisfied on this point, as he was fined.

7. The third case is that of Bhullay Dholie. Though at the time of my local inquiry he denied holding any land at all, I learn from subsequent inquiries that he holds four beegahs, and also gains a livelihood by selling fish, which he catches in a bheel belonging to the landlord, with whom he divides the proceeds. He is likewise a day labourer, and may perhaps make from Rs. 150 to 200 a year. There can be no doubt that the assessment is an improper one. He preferred his objection in the manner prescribed by law; it was taken up and partly heard in his presence, and then postponed to enable him to produce evidence. On the 11th January, the day fixed for hearing, the assessor was absent in the interior. On his return he kept the case pending for some days, but finding that the assessee did not again appear he confirmed the assessment. In so doing he was most clearly in the wrong. There had been no default on the part of the assessee. If the assessor was of necessity absent on the day fixed for hearing the case, another day should have been fixed for it, and due notice of it given to Bhullay Dholie. According to his own statement, which I see no reason to doubt, Bhullay followed the assessor to the village of Joyrampore; not finding him there he returned to Bhowanipore; as he had still not returned he went to his home and took no further steps in the matter. He was in consequence summoned to the Magistrate's court and fined. I solicit permission to have the fine imposed on Bhullay Dholie remitted and repaid to him, together with the cost of the stamp on his petition of objection.

8. The name of Kalla Chund Mundle, who is described by Mr. Kerry as a working sawyer earning 10 pice a day, I cannot find in the register for this village. The man must either belong to another village, or else there has been some mistake in his name. Further

inquiries will be made to ascertain if there is any one of that name in the adjoining village of Paharpore.

9. The case of Prem Chand Lushkur mentioned in the 2nd paragraph of Mr. Kerry's letter, though it belongs to another village, I will here refer to, as I have obtained all requisite particulars from the assessor's papers. He holds in one village 28 biggahs 8 cottahs of land, for which he pays 50 Rs. 1 anna 11-gundas rent. He is the possessor of four bullocks and a cow, and, besides his house, is the owner of two tanks. The assessor received information in the village that this man traded in rice and paddy, and also carried on business as a petty mahajun. This information was corroborated by the fact of his possessing two "doonga" boats or canoes, a fact which Prem Chand himself carefully concealed, but which his own witness admitted he was the owner of.

10. On the 29th January Prem Chand presented his petition of objection to the Deputy Collector at Allipore, by whom it was forwarded to the assessor in camp at Barroepore. Prem Chand appeared there on the 4th, and his objection was taken into consideration; but as he had omitted to bring his witnesses with him the case was postponed till the 25th. On the 25th he attended with his witnesses; their evidence was recorded, and the case again postponed to enable the petitioner to file certain documents. At the further hearing he only produced one rent receipt. His objections were not admitted, and the assessment was confirmed; he paid the amount imposed on him at once.

11. The man's case was fully inquired into by the assessor; it is clear that he had been guilty of concealment, and I see no reason to think that he has not been fairly assessed.

12. As regards the general assessments in the village of Singherate, I find that there are in all 35 persons on whom notices were served; of these 5 paid at once without objection, 7 were released from assessment after enquiry into their objections. In the case of the remaining 23 their objections were in some cases rejected entirely, in others the amount of assessment was reduced. These men are chiefly tailors and carpenters, all holding more or less land, and many of them having workmen employed under them. From the summary enquiry held in the village I must admit that several of these did not appear to me to be liable to assessment, but I had not time on that morning to test the truth of their statements in the manner I should consider advisable. In such cases the inhabitants of a village combine to deceive the assessing authorities, and great care is requisite in testing the accuracy of their statements. The village of Singherate is on the high road and close to Calcutta. The inhabitants, whether liable to income tax or not, are mostly artisans employed in Calcutta or by European firms, and many of them pass every day within a few yards of the collector's office. If the assessor's proceedings had been generally as arbitrary as they now try to make out, it seems hardly probable that they would not have complained before this. The real object of this ventilation of their grievances is not, I am fully convinced, so much with a view of obtaining any relief from last year's assessment as to escape by any means if possible the tax for the current year, the imposition of which they are beginning to dread.

13. Should the Board or Government deem it advisable more minute enquiries can be instituted into the remaining assessments in Singherate, but except in cases like that of Bholay Dholil where obvious injustices have been done the advisability of re-opening assessments which have become final under the law, is open to doubt.

14. In this report, I have purposely confined myself to stating the result of my enquiries in the village of Singherate, but on their conclusion I deemed it advisable to make some further enquiries into the manner in which the assessor had performed his duties. I have already visited his office and inspected the registers, the result of my enquiries, which are still incomplete, will be reported in due course.

From RIVERS THOMPSON, Esq., Officiating Secretary to the Government of Bengal in the Revenue Department, to the Officiating Secretary to the Board of Revenue, Lower Provinces,—(No. 2526, dated Fort William, the 28th June 1870.)

I HAVE the honor to acknowledge the receipt of your letter No. 274B dated the 25th instant, submitting a report from the Commissioner of the Presidency division of the result of his enquiries respecting the allegations contained in a letter which appeared in the *Indian Daily News*, headed "Income Tax oppressions," and signed by the Revd. G. Kerry. In reply I am directed to communicate to you the following observations of the Lieutenant-Governor.

2. It is satisfactory to find that the case is by no means so bad as it was represented to be by Mr. Kerry. Still there is quite enough that is bad to show that the operations of the assessors have not received that careful attention and supervision from the Collector which ought to have given. It betrays great want of method, for example, that an assessor should fix a day for hearing an appeal against his assessment and be absent from his post when the day arrives. This occurred in the case in which the Commissioner has very properly recommended the remission of the fine subsequently imposed by the Magistrate, and it is commonly said to be a thing of frequent occurrence. The Collector should certainly have satisfied himself that in regard to so important a point the assessors conducted their business in such a manner as to prevent harassment and injustice to the people, and should have

prescribed specific rules for their guidance if he found them insensible of the necessity for method and punctuality.

3. Apart from this point, and making every allowance for the very great difficulties which undoubtedly surround the operations of assessors, the Lieutenant-Governor cannot consider that the proceedings of the assessor in the present case were conducted with the care and discrimination which are so essential to prevent the perpetration of injustice and extortion. The inference to be drawn from the circumstances reported by the Commissioner is this—that the assessor without much inquiry assessed every one in the village for whose assessment there appeared to be the faintest shadow of a pretext; and that in doing so he must have well known that he was assessing some who were most unlikely to have incomes of Rs. 500 a year. It is impossible to avoid the conclusion that closer and more careful enquiry by the assessor would have enabled him to satisfy himself that some at least of the 35 persons whom he served with notices were not proper objects to bring under the operation of the Income Tax.

4. The remission and refund of the fine imposed on Bhullay Dholi, together with the cost of the stamp on his petition, are hereby sanctioned.

Weekly Return of Traffic Receipts on Indian Railways.

EAST INDIAN RAILWAY MAIN LINE.

Approximate Return of Traffic for Week ended 11th June 1870 on 1,181½ miles open.

	COACHING TRAFFIC.				" MERCHANDISE AND MINERAL TRAFFIC.				Total Traffic Receipts.							
	Number of Passengers.	Coaching Receipts.			Weight carried.	Receipts.										
		Rs.	As.	P.	£.	s.	d.	Mds. Strs.	Rs.	As.	P.	£.	s.	d.		
Total Traffic for the week	99,019	1,05,439	6	2	2,040	5	6	7,20,743	20	4,40,616	15	6	40,409	7	11	50,848
Or per mile of Railway	83	95	18	5	8	15	8	601	0	369	9	5	34	14	3	44
For previous 13 weeks of half-year	24,21,547	40,15,419	5	8	2,62,254	5	9	1,63,14,780	9	92,70,514	14	1	9,40,798	8	3	12,12,138
Total for 26 weeks	25,20,566	41,26,849	11	11	2,75,294	11	2	1,70,76,023	20	97,11,348	11	7	9,90,295	10	2	12,63,601
COMPARISON.																
Total for corresponding week of previous year	85,224	1,01,510	15	4	2,026	16	9	5,96,174	20	2,99,754	11	7	27,200	15	8	32,497
Per mile of Railway corresponding week of previous year	72	85	9	3	6	4	8	505	0	229	5	10	21	1	0	27
Total to corresponding date of previous year	22,71,189	34,21,085	15	0	2,19,034	19	4	1,71,22,923	10	97,40,220	15	10	8,92,859	19	11	12,11,984

EAST INDIAN RAILWAY JUBBULPORE LINE.

Approximate Return of Traffic for Week ended 11th June 1870 on 223 miles open.

		Rs. As. P.	£ s. d.	Mds. Strs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week ...	5,522	2,061 5 9	406 13 6	57,718 10	16,050 13 0	1,297 19 10	2,178 13 4
Or per mile of Railway ...	25	93 5 2	5 19 5	258 0	72 0 2	6 13 6	9 16 11
For previous 26 weeks of half-year	1,64,653	8,42,775 5 8	51,421 1 3	9,50,863 10	2,70,279 5 6	25,234 15 5	34,765 16 3
Total for 26 weeks ...	1,66,420	8,53,456 9 0	52,206 12 9	10,17,566 20	2,90,430 2 8	26,025 15 8	35,929 9 0
COMPARISON.							
Total for corresponding week of previous year ...	2,612	2,775 6 9	529 4 7	67,750 50	17,341 4 4	1,203 5 6	2,122 10 2
Per mile of Railway corresponding week of previous year ...	12	20 16 8	3 7 5	304 0	77 15 1	7 2 11	9 10 4
Total to corresponding date of previous year ...	76,078	2,21,733 3 4	30,417 4 1	10,76,870 20	2,07,206 7 9	26,109 11 11	34,577 16 6

EASTERN BENGAL RAILWAY.

Approximate Return of Traffic for Week ended 11th June 1870 on 113½ miles open.

	Rs. As. P.	£ s. d.	Mds. Strs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week	22,518	12,119 13 0	1,099 12 6	1,07,743 15	12,777 0 2	1,721 6 6
Or per mile of Railway	207	109 0 0	9 75 0	951 0	112 13 10	15 4 9
For previous 13 weeks of half-year	5,90,614	3,55,040 10 0	31,296 14 6	24,24,320 35	2,81,136 14 11	24,000 9 8
Total for 26 weeks	6,23,230	3,76,990 7 0	32,554 14 2	25,32,183 2	3,00,045 14 24	35,661 14 2
COMPARISON.						
Total for corresponding week of previous year	20,990	12,011 13 24	1,153 11 7	1,24,546 20	12,245 13 9	1,206 13 2
Per mile of Railway corresponding week of previous year	185	114 0 2	10 0 0	1,103 0	104 6 6	13 6 6
Total to corresponding date of previous year	5,95,697	3,54,075 12 42	35,573 16 4	24,26,753 10	2,82,326 11 11	40,200 1 2

CALCUTTA AND SOUTH-EASTERN STATE RAILWAY.

Approximate Return of Traffic for Week ended 11th June 1870 on 28 miles open.

		Rs. As. P.	£ s. d.	Mds. Strs.	Rs. As. P.	£ s. d.	£ s. d.
Total Traffic for the week	5,453	1,012 1 2	161 4 2	15,719 20	402 5 0	49 4 8	130 2
Or per mile of Railway	195	36 2 4	5 12 4	561 0	17 9 4	1 15 2	5 7
For previous 10 weeks of half-year	52,124	9,975 5 0	897 16 7	1,08,149 12	8,590 11 0	606 19 4	1,204 16
Total for 11 weeks	54,643	9,990 6 8	900 0 9	1,23,868 2	4,403 0 0	446 4 0	1,144 4
COMPARISON.							
Total for corresponding week of previous year	4,024	736 7 13	72 14 8	10,456 20	1,379 15 4	126 9 11	190 4
Per mile of Railway corresponding week of previous year	144	26 5 8	2 12 0	373 0	49 4 7	4 10 4	7 2
Total to corresponding date of previous year	50,791	8,668 0 7	879 16 3	1,47,178 9	9,228 8 7	603 3 4	1,734 18

Meteorological Telegraphic Report for the period 18th to 24th June 1870.

Date.	Hour.	Barometer reduced to 32°.	Barometer reduced to sea-level.	Thermometer.		Humidity Sat. = 100.	Wind.		Rain.	Weather initials.	Clouds.	
				Dry.	Wet.		Direction.	Velocity.				
June.												
18th	10	29.490	29.508	85.9	88.5	91	E by N	...	0.08	...	N, K	
16	29.346	29.364	86.3	89.0	88	E	...	...	...	...	S, K
19th	10	29.389	29.398	84.0	86.9	83	E by S	...	...	(D and seeds from E.)	N
16	29.237	29.265	86.0	88.4	85	E N E	...	...	0.10	...	S
20th	10	29.406	29.424	79.0	78.5	97	S S E	...	0.28	o, r	...	
16	29.391	29.399	79.7	78.5	93	S S E	...	...	1.93	o	...
21st	10	29.643	29.661	84.8	86.8	81	S W	...	0.60	...	S	
16	29.697	29.615	78.0	77.6	95	S	...	...	0.39	o, d	...
22nd	10	29.712	29.730	85.6	88.5	87	S W	...	0.14	...	S	
16	29.588	29.608	88.2	89.5	70	S S W	...	...	...	...	S
23rd	10	29.691	29.700	79.0	78.0	95	S S W	...	0.71	o	...	
16	29.617	29.685	80.5	79.0	93	S by E	...	...	0.10	...	...
24th	10	29.684	29.701	77.6	76.6	97	W S W	...	...	o, r	...
16	29.591	29.599	83.9	80.0	89	S S W	...	...	2.96	...	H
18th	10	29.476	29.489	89	85	84	E	...	0.40	b, v	N	
16	29.351	29.357	88	88	80	E N E	1	0.30	b, v, g	NN	...	
19th	10	29.240	29.246	87	83	83	S E	2	0.20	b, p, v	NN	...
16	29.210	29.216	89	88	76	E	3	0.10	b, v, g	NN	...	
20th	10	29.420	29.436	89	80	87	W S W	3	0.40	d, p, o	NN	...
16	29.394	29.400	83	80	87	W	3	0.30	d, p, v, o	NN	...	
21st	10	29.075	29.081	84	80	83	W	4	0.60	d, o	NN	...
16	29.608	29.619	86	83	80	S W	4	...	m, o	NN	...	
22nd	10	29.743	29.744	87	83	83	W	3	...	m, o	NN	...
16	29.607	29.618	89	84	69	S W	2	...	m, o, v	NN	...	
23rd	10	29.715	29.721	86	83	87	W	1	...	m, v, o	NN	...
16	29.639	29.638	86	84	91	W S W	1	...	m, v	NN	...	
24th	10	29.097	29.703	85	83	91	W	...	0.10	...	NN	...
16	29.591	29.597	83	81	91	S S E	0.30	p, o	N	...
18th	10	29.417	29.525	89	81	89	S S E	8.6°	0.10	b, v	K, OS	...
16	29.329	29.437	90	85	78	S	12.2°	...	b, v	K, K8	...	
19th	10	29.437	29.516	86	80	86	E	8.9°	0.30	b, v	K, C	...
16	29.340	29.446	84	78	79	S E	18.3°	...	b, v	K, K8	...	
20th	10	29.550	29.661	80	76	82	E S E	13.3°	0.20	d, v	N	...
16	29.630	29.641	81	77	83	E S E	17.0°	0.60	v, g	K8	...	
21st	10	29.085	29.777	77	76	95	E	13.5°	0.80	r, g	N	...
16	29.629	29.740	78	77	95	E S E	9.9°	1.00	r, o, g	N	...	
22nd	10	29.717	29.828	78	77	95	E	8.5°	4.30	r, o, g	N	...
16	29.613	29.724	80	78	91	S	20.1°	0.80	r, v, g	N	...	
23rd	10	29.082	29.763	82	79	87	S S E	7.3°	...	v, g	K8	...
16	29.600	29.711	80	77	86	W	12.2°	...	v, g	K8	...	
24th	10	29.614	29.723	88	81	73	S W	6.7°	...	b	K	...
16	29.528	29.659	87	83	79	S W	15.0°	...	b	K, CK	...	
18th	10	29.073	29.708	83	75	87	S W	10°	...	o
16	29.599	29.692	86	76	87	S W by W	12°	...	o	...	...
19th	10	29.084	29.714	84	74	80	S W	9°	...	o
16	29.584	29.614	90	74	44	S W	19°	...	o	...	...
20th	10	29.725	29.775	88	74	49	S W	13°	...	o
16	29.611	29.641	95	76	36	S W	18°	...	b, o	...	...
21st	10	29.777	29.807	83	76	43	S W by W	17°	...	b, o
16	29.671	29.701	86	77	64	S by E	18°	...	b, o	...	...
22nd	10	29.821	29.851	91	76	47	W S W	12°	...	b, o
16	29.689	29.712	90	77	83	Calm	...	...	b, o	...	...
23rd	10	29.828	29.856	90	76	80	W	10°	0.17	b, o
16	29.712	29.744	87	78	68	S E	13°	...	b, o	...	...
24th	10	29.608	29.838	88	78	63	W	10°	4.70	b, o
16	29.678	29.708	90	78	56	E	7°	...	o	...	...
18th	10	29.619	29.500	81	83	66	S W	14.5°	...	o, v	OK, K8, N	...
16	29.395	29.417	88	79	83	E	10.5°	1.90	r, d, v, o, w	N	...	
19th	10	29.558	29.441	82	79	87	W by S	10.2°	...	o, v	N	...
16	29.248	29.331	88	79	87	S W	10.5°	1.90	r	N	...	
20th	10	29.378	29.440	83	79	83	S W	9.3°	0.40	d	N	...
16	29.333	29.415	85	79	76	S	22.5°	0.10	d, v, w	N	...	
21st	10	29.803	29.685	86	81	79	S W	21.0°	...	o, v, g	N	...
16	29.517	29.599	86	80	69	S	29.6°	...	d, v, g	CS, N	...	
22nd	10	29.647	29.729	88	81	73	S	19.4°	...	u	CS, N	...
16	29.550	29.639	86	81	79	N by E	22.2°	1.90	r, t, v, o, w	OK, N	...	
23rd	10	29.679	29.761	88	84	83	S	16.1°	...	m	OK, CS	...
16	29.613	29.683	84	80	83	E by S	14.0°	...	t, v, w	N	...	
24th	10	29.609	29.744	86	82	83	S W	11.7°	...	o, v	K8	...
16	29.545	29.657	89	81	69	S W	6.7°	0.70	o, v, r	K8, N	...	
18th	10	29.684	29.682	83	79	83	S S E	1	1.90	p	OK, CS	...
16	29.485	29.613	83	79	83	S S E	2	0.39	o, g	M, K8,	...	
19th	10	29.605	29.620	79	77	90	N N E	2	1.40	t, p, q	N	...
16	29.440	29.455	81	77	82	N E by N	2	0.60	t, g	N	...	
20th	10	29.780	29.765	77	75	90	N N E	3	3.60	o, r	N, K8, C	...
16	29.707	29.723	78	76	86	S S E	2	2.80	o, p	M, K8, C	...	
21st	10	29.742	29.767	80	76	89	S S E	2	1.30	o, v, g	K8	...
16	29.704	29.800	79	77	90	S S E	3	0.30	o, g	K8, N	...	
22nd	10	29.831	29.846	80	78	91	S S E	1	1.20	g	K8, N, C	...
16	29.769	29.784	81	78	86	Calm	...	0.60	g	O, CS, CK	...	
23rd	10	29.851	29.856	80	77	86	S S E	1	1.50	o, g	K, N	...
16	29.758	29.761	82	78	82	Calm	...	...	b	C, CK	...
24th	10	29.778	29.791	82	78	69	S S E	1	...	b	O	...
16	29.768	29.781	83	78	82	S S E	1	1.10	b, r	C, OK, CS	...	

* Velocity of wind in miles per hour.

CALCUTTA,
The 25th June 1870. }HENRY F. BLANFORD,
Meteorological Reporter to the Govt. of Bengal.

Weekly Report of Rainfall compiled at the Meteorological Reporter's Office

CIRCLES.	STATIONS.	Rainfall from 6th to 15th June 1870.	Rainfall from 15th to 19th June 1870.	RAIN FROM 1st JANUARY 1870.		REMARKS.
				Rain.	Up to date.	
		Inch.	Inch.	Inch.		
SOUTH-WESTERN.	Koorse	Nil	Not received	0.91	12th June 1870.	
	False Point	Not received	ditto	2.00	5th June 1870.	
	Cuttack { Telegraph Office	0.70	3.80	3.50	10th June 1870.	
	Jail	0.70	Not received	6.30	12th June 1870.	
	Sambulpore	2.20	ditto	7.00	ditto	
WESTERN.	Balasore	Nil	ditto	6.57	ditto.	May to 6th
	Midnapore	Not received	ditto	4.20	5th June 1870.	
	Bancoorah	1.30	ditto	8.85	12th June 1870.	
	Chyobassa	0.78	2.87	8.83	12th June 1870.	
	Purulia	0.40	3.65	8.73	ditto.	
	Gobindpore	Not received	Not received	0.98	5th June 1870...	Not received 1st January to 22nd May.
	Palamow	0.08	ditto	0.08	12th June 1870.	Not received 1st January to 5th June.
	Burdwan	0.51	0.40	6.89	12th June 1870.	Not received 2nd & 6th May.
	Raneogunge	2.12	2.84	9.40	ditto	
	Sooree	0.74	2.88	8.65	ditto.	
CENTRAL.	Deoghur	0.39	Not received	3.13	12th June 1870.	
	Burhee	0.40	2.87	4.82	12th June 1870...	Not received 3rd to 16th January and 7th February to 6th March.
	Hastreebaugh	1.38	Not received	3.81	12th June 1870.	
	Ranchee	1.54	4.09	6.98	12th June 1870...	Not received 1st January to 20th March.
	Sasaram	0.16	0.40	1.56	ditto	Not received 1st January to 27th March.
	Saugor Island	0.10	5.50	13.40	ditto.	
	Contai	0.72	2.67	6.37	ditto.	
	Calcutta	0.63	5.63	14.20	ditto.	
	Howrah	0.72	1.38	9.65	ditto.	
	Alipore	0.52	2.79	6.83	ditto	Not received 1st January to 29th May.
	Barrackpore	0.80	Not received	1.70	12th June 1870...	Not received 1st January to 16th May.
	Dum-Dum	Nil	ditto	0.52	ditto	ditto
	Barasat	0.40	ditto	2.28	ditto	ditto
	Satkhora	0.64	ditto	6.28	ditto	ditto
	Boserhat	1.20	ditto	8.60	ditto	ditto
	Diamond Harbour	Nil	ditto	2.66	ditto	ditto
	Barrigora	0.68	ditto	4.18	ditto	ditto
	Hooghly	1.06	1.47	11.78	12th June 1870.	
	Jessore	0.62	6.07	19.62	ditto.	
	Kishnagur	0.31	Not received	7.79	12th June 1870...	Not received 1st to 16th Jan. and 4th to 10th April.
	Ranaghat	Not received	ditto	4.65	8th June 1870...	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
	Bongong	2.20	ditto	7.36	12th June 1870...	Not received 1st to 9th Jan. and 4th to 10th April.
	Maharpore	Not received	ditto	3.00	5th June 1870...	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
	Choudangah	ditto	ditto	7.00	ditto	Not received 1st Jan. to 6th Feb. and 4th to 10th April.
	Koeshteah	0.12	2.72	11.57	12th June 1870.	
	Berhampore	1.08	4.26	9.89	ditto.	
	Furzedpore	0.80	Not received	16.60	12th June 1870.	
	Burrisaul	3.47	1.14	18.43	12th June 1870.	
	Bhaugulpore	0.78	2.44	4.89	ditto.	
	Mudhappoorah	0.90	0.63	3.22	ditto	Not received 1st Jan. to 1 May.
EAST-WESTERN.	Banka	0.96	1.30	6.46	ditto	Not received 1st Jan. to 24th April and 2nd to 29th May.
	Monghyr	0.66	0.78	2.45	12th June 1870.	
	Jamocoe	0.48	0.67	3.28	ditto	Not received 1st Jan. to 24th April.
	Begoozari	0.84	Not received	0.43	12th June 1870...	Not received 1st January to 15th May and 23rd to 29th May.
	Gya	Nil	1.29	2.00	12th June 1870...	Not received 1st to 16th Jan. and 11th to 17th April.
	Sherghotty	Not received	2.20	2.90	ditto	Not received 1st January to 12th June.
	Behar	0.20	Not received	0.99	12th June 1870...	Not received 1st Jan. to 30th March.
	Patna	0.10	ditto	1.15	ditto.	
	Bhabhoosh	Nil	1.40	2.40	12th June 1870...	Not received 1st Jan. to 24th April.
	Barh	0.66	Not received	0.88	12th June 1870...	Not received 1st Jan. to 15th May.
	Arrah	0.10	0.63	3.72	12th June 1870.	
	Buxar	Nil	0.10	1.47	ditto.	
	Chuprah	0.02	2.87	4.49	ditto.	
	Sevan	Nil	2.92	3.50	ditto	Not received 1st Jan. to 1st May.
	Chumpanun	Not received	Not received	3.80	6th June 1870...	Not received 2nd to 16th Jan.
	Benares	Nil	Nil	0.51	12th June 1870.	
	Misafferpore	0.80	Not received	4.10	12th June 1870.	Not received 1st Jan. to 1 Feb.
	Diaspore	0.88	1.14	2.48	12th June 1870...	Not received 1st Jan. to 1 Feb.

CITY.	STATIONS.	Rainfall from 6th to 12th June 1870.	Rainfall from 12th to 18th June 1870.	RAIN FROM 1ST JANUARY 1870.		REMARKS.
				Rain.	Up to date.	
		Inch.	Inch.	Inch.		
18th	Rampore Beaulah	1.05	2.05	0.79	19th June 1870.	Not received 1st Jan. to 1st May.
	Natore	0.21	Not received	4.69	19th June 1870.	
	10	0.80	3.65	11.60	19th June 1870.	
	18	1.22	Not received	6.69	13th June 1870.	
19th	10	0.82	ditto	2.37	ditto	Ditto ditto. Not received 1st Jan. to 16th May.
	18	2.20	ditto	3.79	ditto	
20th	10	2.20	ditto	11.06	ditto	Not received 1st to 9th Jan. and 2nd to 8th May.
	18	2.20	ditto	9.83	ditto	
21st	10	2.20	ditto	20.60	ditto	Not received 14th to 20th Feb. Not received 10th to 23rd Jan., 21st to 27th Feb., and 7th March to 3rd April.
	18	2.20	ditto			
North-Bangor.	Dinapore	2.25	ditto			Not received 1st to 9th Jan. and 2nd to 8th May.
	Rangpore	2.00	ditto			
	Buxa	Not received	ditto	10.90	30th April 1870.	
	Rangbue	ditto	ditto	23.25	31st May 1870.	
North-Bangor.	Darjeeling { Telegraph Office	ditto	ditto	10.57	ditto.	Not received 1st to 20th May.
	Jail	4.81	ditto	22.41	18th June 1870.	
	Gowalparah	26.21	5.95	51.51	19th June 1870.	
	Dobree	25.06	4.31	80.92	ditto	
North-Bangor.	Gowhaty	11.72	Not received	27.39	18th June 1870.	Not received 1st to 20th May.
	Shillong	4.33	ditto	10.38	ditto	
	Nunklow	Not received	ditto	11.60	31st May 1870.	
	Nowgong	ditto	ditto	18.30	5th June 1870.	
North-Bangor.	Tespore	6.68	ditto	29.69	12th June 1870.	Not received 2nd to 8th May.
	Dholebagman	8.81	ditto	23.87	ditto	
	Sebsangor	6.10	ditto	29.70	ditto	
	Debrooghur	19.80	ditto	30.21	ditto	
North-Bangor.	Samooogooding	Not received	ditto	12.00	5th June 1870.	Not received 1st and 2nd Jan.
	Dacca { Telegraph Office	ditto	ditto	4.17	30th April 1870.	
	Jail	1.00	ditto	6.35	18th June 1870.	
	Mymensing	1.85	ditto	8.39	ditto	
North-Bangor.	Sylhet	11.82	ditto	32.23	ditto	Not received 10th to 16th Jan. and 14th to 20th Feb. Not received 8th to 9th Jan. and 28th March to 17th April.
	Cachar	11.49	ditto	29.19	ditto	
	Aenakhall Hyal	10.60	ditto	30.26	ditto	
	Tipperah	0.41	ditto	19.04	ditto	
North-Bangor.	Noakhally	0.20	ditto	6.50	ditto	Not received 14th to 20th March.
	Chittagong { Telegraph Office	1.30	2.31	17.21	19th June 1870.	
	Jail	0.97	Not received	10.35	12th June 1870.	
	Rangamata Hill	2.80	ditto	18.20	ditto	
South-Bangor.	Akyab	8.00	7.50	43.10	16th June 1870.	

CALCUTTA,
The 25th June 1870.

HENRY F. BLANFORD,
Meteorological Reporter to the Government of Bengal.

Results of the Meteorological Observations taken at the Surveyor-General's Office, Calcutta, from 15th to 21st June 1870.

MONTH.	Date.	Mean reduced Barometer.	THERMOMETER.		Max. Solar radiation.	Mean Dry Bulb.	Mean Wet Bulb.	Computed Mean Dew-point.	Mean degree of humidity.	WIND.			Rain.	GENERAL REMARKS.
			Highest Reading.	Lowest Reading.						Prevailing direction.	Max. pressure.	Daily velocity.		
		Inches.	°	°	°	°	°	°			h	Miles.	Inches.	
June	15th	29.889	94.5	82.3	139.2	87.5	81.1	77.3	0.72	S & S S W	...	220.1	...	Cirri, cumuli & a few. Light to W. at 8 p.m.
	16th	29.845	91.9	81.4	109.5	84.5	81.4	79.3	85	S S W & S by E	...	185.0	0.17	Stratoni, cumuli overcast. Thunder at 0.4 & 10.4 & at 1 & 2.5. Lightning to at 8 p.m. Rain at 9.4 p.m. from 1 to 3 p.m.
	17th	29.804	88.2	78.6	...	82.8	81.0	79.7	91	S by E & S S E	...	105.8	4.39	Stratoni & overcast. Thunder & lightning between 11 noon & 1 p.m. Rain at 11 a.m. to 4 p.m.
	18th	29.800	88.9	80.2	130.0	83.9	81.1	79.1	85	E & S S E	...	100.0	0.00	Stratoni & cumuli. Lightning at 10 p.m. Slight rain at 1.4, 9 & 12.4 & at 1.4 p.m.
	19th	29.800	87.0	80.2	110.0	83.0	80.5	78.7	87	E & E N E	...	374.4	0.86	Stratoni & cumuli. Thunder at 9 p.m. Rain at 10 p.m. Rain at 10 p.m. Rain at 10 p.m.
	20th	29.805	80.8	78.2	...	79.8	78.8	78.1	86	E S E & S S E	...	301.8	2.53	Overcast. Rain drizzled whole day.
	21st	29.802	84.8	77.0	...	79.8	77.8	76.1	89	S by W, S W & S S W	...	164.9	0.78	Overcast. Thunder at 2.4 & 3.4. Lightning to at 9 p.m. Rain from 9.4 to 9 p.m.

The mean Barometer, as likewise the Dry and Wet Bulb Thermometer means, are derived from the twenty-four hourly observations made during the day.

The Dew-point is computed with the Greenwich constants.—The figures in column 10 represent the humidity of the air, the complete saturation of which being taken at unity. The receiver of the lower rain gauge is 1½ feet, and that of the Anemometer 70 feet 10 inches above the level of the ground.—The velocity of wind, as indicated by Robinson's Anemometer, is registered from noon to noon.

The extreme variation of temperature during the past seven days	...	17.5
The max. temperature during the past seven days	...	94.5
The max. temperature during the corresponding period of the past year	...	94.9
The mean humidity during the past seven days	...	0.87
The mean humidity during the corresponding period of the past year	...	0.76
		Inches.
The total fall of rain from 15th to 21st	{ by lower rain gauge	8.26
	{ by Anemometer gauge	7.60
Ditto ditto, average of sixteen previous years	...	3.22
Ditto between the 1st January and the 21st current	...	17.73
Ditto ditto ditto, average of 16 years...	...	20.19

GOPERNATH SEN,
In charge of the Observations.

The 25th June 1870.